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Student career centers measurement scale in higher education: exploratory and confirmatory factor analysis

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ABSTRACT

Previous research shows that measuring the quality of student career centers in higher education is not yet fully standardized and is often limited to qualitative approaches. The lack of valid and reliable measuring tools regarding the student career center can hamper efforts to improve and develop this service. The aim of the research is to develop and test a scale for measuring the quality of student career centers in the context of higher education. A quantitative approach with exploratory and confirmatory factor analysis (CFA) was used in this study, with respondents as many as 562 students from three different universities. Analysis and interpretation of the measurement scale evaluation was carried out in two stages, namely exploratory factor analysis (EFA) and continued with CFA. The research results identified that the dimensions of the role of career centers, utilization of career centers, management of workforce information, and fostering entrepreneurship are key elements that influence the effectiveness and impact of career centers in higher education. This scale can practically be used by each institution to evaluate the quality of the career centers they run, and can also be used by other researchers for further research.

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1. INTRODUCTION

Over the last few decades, higher education has become the global attention in efforts to enhance the excellence of human resources, innovation and competitiveness of a country [1]. In this context, higher education institutions have a major role in preparing students for their professional careers. The role of higher education is not only to provide quality education, but also to function as an institution that helps students develop the skills, knowledge and competencies needed to be successful in their careers [2], [3].

The student career center is one of the main elements in the universities efforts to support students on their journey towards their careers [4]. These career centers play a role in providing services and resources that help students navigate their career preparation process, from identifying interests and career goals to job searching, interview training, and developing essential skills [5]. Ironically, looking at data released by the Central Statistics Agency of the Republic of Indonesia, the number of university graduates who are not yet working in 2022 will reach 4.76% or 832,975 people, out of a total workforce of 17,504,562 university graduates. In fact, if examined further, of the college graduates who have not worked, 509,341 or 61.15% have never worked at all, this indicates that something is not right in the management of career centers in

universities. However, to ensure the effectiveness of student career centers, there needs to be a tool that can measure the quality of the services they offer and their impact on students [6], [7].

Previous research shows that measuring the quality of student career centers in higher education is not yet fully standardized and is often limited to qualitative approaches, such as customer satisfaction surveys or student interviews [8], [9]. The absence of robust and dependable assessment instruments pertaining to the student career center can impede endeavors to enhance and advance this service [10]. Several dimensions that are crucial in assessing the quality of student career centers have been established in numerous prior research. Numerous scholarly investigations have underscored the significance of having sufficient resources at one's disposal, including access to pertinent information regarding employment prospects, opportunities for skill development, and assistance in securing employment [11], [12]. Furthermore, factors such as the efficacy of communication between career center personnel and students, the level of trust students place in the services offered, and the degree of student satisfaction are also deemed significant when assessing the caliber of career centers [13], [14].

While earlier studies have highlighted these features, there remains a necessity to establish measuring instruments that are both accurate and reliable in assessing the quality of student career centers. The assessment of the efficacy of student career centers poses numerous difficulties. A thorough evaluation method is necessary in order to address the different nature of professional development and the varying demands of students [15], [16]. Furthermore, the lack of established measurements and evaluation methods poses a challenge in regularly assessing these centers. In order to tackle these issues, scholars have directed their attention towards the creation of customized measurement scales for the evaluation of different aspects of student career centers [8], [17], [18]. Numerous assessment measures have been devised to evaluate student career centers within the realm of higher education. An illustrative instance can be found in the performance ratings scale for university career services developed by Olive *et al*. [19]. This scale consists of nine indicators that can be used to measure the effectiveness of career center performance at universities. The utilization of this approach has been extensively employed to evaluate the efficacy of student career centers in enhancing student career outcomes. Another important scale is the student career and job placement services scale developed by Manlagaylay and Añar [20]. The measurement scale assesses the quality of services offered by career centers and includes dimensions such as counseling services, workshops, job fair implementation, job placement services, and career development. This scale is used to measure the overall effectiveness of the student career center in supporting student career development.

Based on the two scales that have been developed by previous researchers, the role of student career centers in encouraging students to pursue careers as entrepreneurs is still unclear. Meanwhile, during recent times, several researchers have recommended entrepreneurship as an alternative career that students can take [21]–[23]. This research certainly tries to complement previous researches, by adding aspects of entrepreneurship as one of the tasks that must be carried out by career centers [24], [25]. Apart from that, this research also seeks to develop a scale that is appropriate to the context of Indonesia, which is certainly different from foreign countries, where one of the real differences is the existence of different levels of higher education status. In Indonesia there are three types of higher education status levels, namely the State Higher Education Institution of Incorporated Legal Entity, State Higher Education Institution of Public Service Agency, and State Higher Education Institution Work Unit, which have different higher education management autonomy [26].

It is hoped that this research will provide a valuable contribution to the understanding of the services quality offered by student career centers in higher education. Practically, this research contributes to student career centers in higher education in identifying areas that need to be improved in their career center services, as well as for future researchers to use this scale as a tool to collect data about the quality of student career centers in various higher education contexts. It is hoped that this research will provide deeper insight into how student career centers can be more effective in supporting students in achieving their career goals. This research aims to develop and test a scale for measuring the quality of student career centers in the context of higher education. This measurement scale is designed to measure various aspects relevant to the quality of the career center.

2. RESEARCH METHOD

2.1. Research design

This study employed a quantitative methodology, utilizing both exploratory and confirmatory factor analysis (CFA) techniques. The primary objective of this study was to construct a comprehensive assessment scale for evaluating the quality of student career centers. The scales of this study were validated using exploratory and CFA, as this methodology aligns with prior research [27]–[29]. Before performing structural equation modeling (SEM), the items in this study were initially categorized under each construct (factor)

using exploratory factor analysis (EFA). The subsequent phase, which involved performing the procedure of CFA, the constructs of the scale were validated.

2.2. Population and sample

The population in this study were students from three different universities in Indonesia, namely Universitas Negeri Malang (UM), Universitas Negeri Jakarta (UNJ), and Ahmad Dahlan Sinjai Islamic University (UIAD). The selection of the three universities was based on the need for representatives from universities with the status of State Higher Education Institution of Incorporated Legal Entity (UM), State Higher Education Institution of Public Service Agency (UNJ), and private universities (UIAD). In the context of universities in Indonesia, there are three types of higher education status levels, as previously mentioned. What differentiates each status is the level of autonomy in managing existing resources at the university, which is also a consideration in determining the population in this research.

The sample was gathered using convenience sampling, according to Collins *et al*. [30], the optimal sample size should be more than or equal to 200 to avoid bias and inaccuracy. As a result, 800 online questionnaires (Google Forms) were disseminated over WhatsApp to three distinct universities. Respondents were informed about the goal of the study and the significance of their responses to ensure research ethics. They were instructed that there were no correct or incorrect responses and that all solutions were valued. Furthermore, taking part in surveys is voluntary, and responses are anonymous, so only the researcher knows who answered the question [31]. A total of 800 surveys were distributed, with 562 acceptable surveys returned for a response rate of 70.25%.

2.3. Research instruments

The scale from previous research was used as the main reference source in developing a scale for measuring the quality of student career centers in higher education as a whole [19]–[21]. The scale for measuring the quality of student career centers in higher education consists of 17 items which operationalize the quality of student career centers as an assessment or impression of students based on aspects of the role of career centers, utilization of career centers, management of employment information, and entrepreneurship coaching (EC). The study instrument was subjected to an expert assessment procedure, wherein two judges with expertise in scale construction and student career center quality assessed the items for ambiguity, relevance and similarity [32]. This study used a Likert-type scale consisting of four points, and the questionnaire has been translated into Indonesian to enhance comprehensibility for the participants.

2.4. Data analysis

Recommended scale development procedures by Churchill [33] were used to develop sub dimensional scales. In assessing the relationship between variables, a series of data analyzes were carried out using SPSS 24 and AMOS 24 software. In this investigation, analysis and interpretation of the measurement scale evaluation were conducted in two stages: initially, EFA with SPSS 24 software was conducted to extract various factors using varimax rotation. This process begins with an initial set of items resulting from EFA. On the exploratory sample, an initial EFA of the primary dimension measures was conducted to determine the dimensions of these constructs. Principal-components factoring with oblimin rotation is utilized in this analysis. Second, evaluate the model's validity and dependability using CFA with AMOS 24. When the factor loading is >0.50 [34], the average variance extracted (AVE) value is >0.50 [35], and the construct reaches reliability when the composite reliability (CR) is >0.70 [34], convergent validity is achieved. By comparing the square root value of AVE to the correlation coefficient between constructs, discriminant validity is ensured [36]. The criteria suggested by previous researchers [34], [37] are used to evaluate the empirical framework that was applied in this research to determine whether or not it is suitable for use. These criteria include the requirement that the root mean squared error of approximation (RMSEA) index value and the root mean square residual (RMR) should be less than 0.08. Additionally, the goodness of fit index (GFI), Tucker-Lewis's index (TLI), and comparative fit index (CFI) values should exceed 0.90. Furthermore, the CMIN/df value should be lower than 3.00.

3. RESULTS AND DISCUSSION

3.1. Results

3.1.1. Exploratory factor analysis

This research employed EFA using SPSS 24 software to extract various factors. Generates four different factors based on EFA results using varimax rotation. First factor is career center role (CCR). The second factor is called career center utilization (CCU). The third factor is called labor information management (LIM). The fourth factor is EC. The selected scale items in this study are improved using corrected item total correlation (r). This analysis assists in removing insignificant components that might

have an impact on the EFA results. As a result, as suggested by Hair *et al*. [34] and showed in Table 1, all items in the data set have coefficients that remain at the suggested value of 0.40. Additionally, Cronbach's alpha employed with an adequate threshold of 0.70 [38] to preserve internal consistency and validity of the examined constructs. All research construction coefficients above the minimum acceptable value, and the results are shown in Table 1. Moreover, according to Cain *et al*. [39], each of the chosen items demonstrates a normal distribution because each item's skewness and kurtosis values fall between -2 and +2. A sample adequacy test and Bartlett's test of sphericity were also performed by Kaiser-Meyer-Olkin (KMO) to assess the viability of conducting EFA on the gathered data. As shown in Table 1, it may be deduced that that the data are sufficiently suitable for factor analysis because the KMO value for the data set is more than the cutoff value of 0.60 [40]–[42]. The possibility of conducting factor analysis on the data set was further supported by Bartlett's test of sphericity, which produced a p value below 0.05.

Table 1. Exploratory factor analysis

Construct	Eigen values	Explained variance (%)	α	r	KMO	BTS (p)
CCR	8.516	23.180	0.793	0.563–0.735	0.825	232.517 (0.000)
CCU	4.392	15.727	0.882	0.681–0.840	0.784	364.468 (0.000)
LIM	3.680	11.344	0.906	0.714–0.828	0.869	418.472 (0.000)
EC	1.241	5.512	0.855	0.728–0.871	0.816	293.684 (0.000)

Due to the fact that the measuring scales in this study relied on participants' own reports, a number of different tests were conducted in order to evaluate the likelihood of method variance. Running an EFA in SPSS was the initial step in this statistical analysis. In this step, all of the items from each construct are loaded at the same time in order to determine the least number of factors required to fully explain the variable variation. According to the findings of the factor analysis, there are four distinct factors, all of which have eigenvalues that are more than 1.0. It would appear that common method bias was not an issue in this study [31], as there were four independent components that accounted for 55.76% of the total variance, and the first major component accounted for 23.18% (which is less than 50%).

3.1.2. Confirmatory factor analysis

According to Hair *et al*. [34], a technique known as CFA can be used to examine how well variables can reflect a concept. CFA is used to determine whether the hypothesized model or proposed model factor structure is consistent with field data [37], [38]. This is done by comparing the hypothesized model or proposed model factor structure to the field data. Additionally, CFA can be utilized to construct assessment questions based on relevant theory [34], [43]. After the model was constructed, it was put to the test by analyzing both the loading factors and the variables that were observed [44]. In this study, SEM is employed since it enables researchers to more easily construct intricate relationship models. In addition to that, SEM was utilized in order to validate the model that was provided in this research because the method is applicable to prior research [27], [29], [45]. The model was only used to represent a hierarchical factor construct model because its use was restricted to that scope. As a major quality construct for students' careers in higher education, the second-order factor is represented using a four-factor hierarchical model. This model is used to represent the factor. The hypothesized structure was validated by the CFA results, which were generated from individual replies.

In order to assess the appropriateness of the model, the factor loading of each observable variable for each latent variable is initially examined. The process of loading (λ) is used to assess the relationship between observed variables (x) and latent components (ζ). According to Hair *et al*. [34], there is a positive relationship between the factor loading score of each item and its contribution to explaining the matrix factors. This study aims to build a comprehensive quality model for student career centers in higher education. The model consists of four sub-dimensions, which include the role of career centers, utilization of career centers, administration of job information, and entrepreneurship development. The findings from Figure 1 and Table 2 indicate that the first-order factors had considerable loadings on the general factor, specifically pertaining to the quality of student career centers. All characteristics, such as the role of career centers, utilization of career centers, administration of employment information, and entrepreneurship growth, have a strong association with the maximum loading factor (1.00).

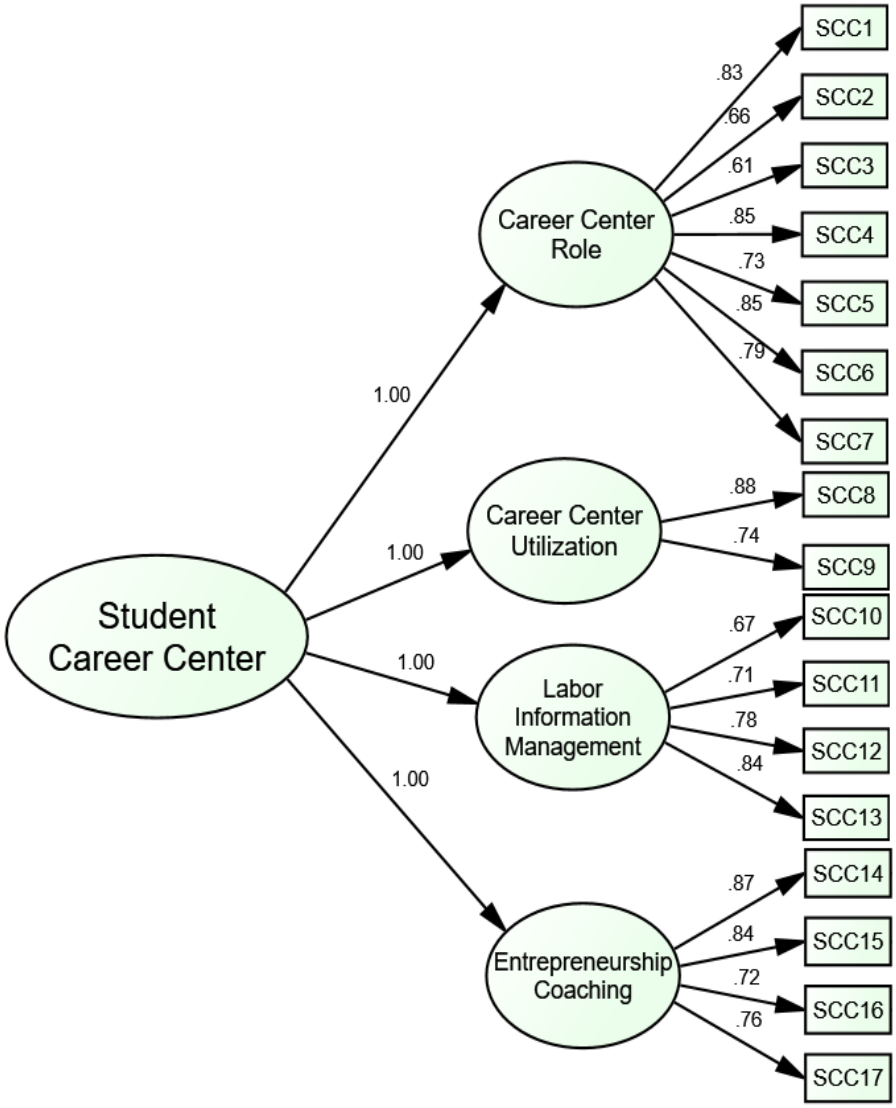

Figure 1. Hierarchical factor model

Four distinct factors are produced by EFA, as previously mentioned, and CFA is used to validate these factors. As can be shown in Table 2, the measurement model had strong convergent validity because the factor loading value ranged between 0.61 and 0.88 (above 0.50), the CR value ranged between 0.79 and 0.91 (above 0.70), and the AVE value for each construct ranged between 0.57 and 0.66 (above 0.50). Finding the discriminant validity of a measurement model is the next stage in the evaluation process. Discriminant validity is rated as adequate based on the findings of the analysis of discriminant validity, which are displayed in Table 3. This is so because the correlation between constructs is less than the AVE for each construct's square root value. As further emphasized by Rönkkö and Cho [36], the basic premise of discriminant validity analysis is that measures of distinct constructs do not always need to be highly linked with one another.

Figure 1 illustrates that the overarching components of the student career center model are influenced by the four primary aspects within the model. The model exhibits a CMIN/df score below the threshold of 3.000. This demonstrates that the model exhibits a strong alignment with the data. This assertion is further supported by the RMSEA and RMR scores, which are reported as 0.070 and 0.062. Additionally, the TLI, GFI, and CFI values range from 0.954, 0.943, and 0.959, respectively. This finding demonstrates the acceptability of the structural model pertaining to the quality of student career centers. The model fit index is displayed in Table 4. Concurrently, Table 2 presents the estimated loading factors of the first-order and model items as obtained from the procedure's findings.

Table 2. Loadings factor of hierarchical model, items, CR, and AVE

Second-order factor	First-order factors (loadings)	Indicators (encode)	Statements	Loadings	CR	AVE
Student career center	CCR [1.0]				0.91	0.59
		SCC1	The career center organizes training to improve the soft, technical and personal skills needed by students	0.83		
		SCC2	The career center provides internship opportunities for students	0.66		
		SCC3	Career centers utilize information technology to bring together job seekers and workforce users (online)	0.61		
		SCC4	The student career center holds regular job fairs which are attended by many agencies/companies	0.85		
		SCC5	The career center provides job application services through the career center	0.73		
		SCC6	The career center provides career counseling services for prospective graduates carried out by professional counselors/consultants	0.85		
		SCC7	The career center conducts inquiries pertaining to the status of alumni, particularly in relation to their employment search, work circumstances, and the development of skills acquired during their time in college (tracer study)	0.79		
	CCU [1.0]				0.79	0.66
		SCC8	Students and alumni take part in every activity held by the career center and take advantage of the facilities available	0.88		
		SCC9	There are special rooms and facilities to support career center activities	0.74		
	LIM [1.0]				0.84	0.57
		SCC10	The career center carries out outreach activities to students/prospective graduates	0.67		
		SCC11	The career center carries out promotional activities to agencies/companies using workforce and companies providing job market services (especially online) to encourage cooperation	0.71		
		SCC12	The career center publishes print and virtual (online) media containing career center information and services, agency/company information, and job vacancy information	0.78		
		SCC13	The student career center has an employment information system	0.84		
	EC [1.0]				0.88	0.64
		SCC14	The career center provides entrepreneurial skills and management training	0.87		
		SCC15	The career center provides intensive coaching for students who already have businesses	0.84		
		SCC16	The career center holds entrepreneurship programs for students, for example in the form of capital assistance	0.72		
		SCC17	Students take part in entrepreneurship competitions at both campus and national levels	0.76		

Table 3. Discriminant validity

Construct	1	2	3	4
1. CCR	0.768			
2. CCU	0.571	0.812		
3. LIM	0.329	0.647	0.755	
4. EC	0.575	0.463	0.504	0.800

Table 4. Fit indices

Fit indices	Results	Criteria	Information
RMSEA	0.070	≤0.080	Good
RMR	0.062	≤0.080	Good
TLI	0.954	≥0.900	Good
GFI	0.943	≥0.900	Good
CFI	0.959	≥0.900	Good
CMIN/df	2.217	≤3.000	Good

3.2. Discussion

Student career centers are an integral component of higher education institutions, facilitating the transition from student life to the world of work [46]. These units offer a variety of services, including job search assistance, career counseling, resume and interview preparation, entrepreneurial skills and networking

opportunities [24]. In addition, they often collaborate with employers to facilitate internship and job placement opportunities for students [47], [48]. Previous research underscores the important role of student career centers in improving students' employability and career success [7], [49]. Students who engage with career centers tend to have higher job placement rates, more prepared resumes, better interviewing skills and entrepreneurial skills compared to their peers who do not utilize the services career centers provide. As a result, the quality of services provided by the student career center has a direct impact on student career outcomes.

In developing and validating the student career center measurement scale, the dimensions of the role of career centers are one of the key aspects that must be considered. The role of career centers in providing career-related guidance, information, and resources is very important to help students plan their future [50]. Various research results show that students tend to feel more satisfied with career centers that are active in providing guidance services, career skills training, and internship opportunities [16], [51]. A strong CCR is also related to the level of student participation in programs offered by career centers, such as career fairs, workshops, and individual counseling sessions [52]. Therefore, the role of an effective career center not only supports the development of students' career skills, but can also increase their confidence in finding work and building a successful career.

The use of career centers by students is an important aspect in the context of measuring career center performance [53], [54]. Students who actively use the services offered by career centers have a better chance of finding jobs that match their interests and qualifications. Apart from that, career centers must also be supported by adequate supporting facilities [13]. Students who find career center services useful and relevant to their career goals tend to provide positive evaluations of the career center [8], [55]. Therefore, efforts to increase the use of career centers by students must be the main focus in increasing the effectiveness of career centers in higher education.

An effective career center must be able to collect, summarize, and convey the latest information about employment trends and career opportunities to students [13], [56]. In this context, the integration of information technology and social networks in the communication of career information can be a very effective tool in helping students understand various aspects of the world of work [57]. Management of employment information by career centers has a significant impact on students' understanding of job opportunities in the labor market. Students who have good access to information about job opportunities, labor market trends, and career requirements have an advantage in planning their future [52], [58].

Entrepreneurship development is an important aspect of the career center's efforts to help students develop skills and interest in entrepreneurship [59], [60]. Students who receive EC have a higher tendency to take steps to start their own business after graduation [24], [61], [62]. Career centers that are active in providing support for students interested in entrepreneurship can have a positive impact on the development of entrepreneurship in a region or community college [63], [64]. This not only helps students achieve their entrepreneurial potential, but also contributes to economic growth and innovation in communities.

Throughout this discussion, we have identified that the dimensions of the role of career centers, utilization of career centers, management of workforce information, and fostering entrepreneurship are key elements that influence the effectiveness and impact of career centers in higher education [24], [46], [55]. The results of this research provide valuable insights for higher education institutions in improving the quality of their career center services to support students in achieving their career success. Further research could develop and deepen understanding of these factors in the broader context and variety of higher education institutions.

4. CONCLUSION

Student career centers play a crucial role in higher education institutions, and it is of utmost importance to establish measuring scales that can effectively evaluate their efficacy. The use of this scale offers significant discernment into the quality of service, the level of happiness among students, and the influence of career center services on the development of students' careers. As the labor market undergoes continuous transformation, the diligent investigation and enhancement of these assessment instruments will empower educational institutions to more effectively equip their students for prosperous and satisfying professional trajectories. Subsequent investigations ought to incorporate variables such as the attainment of alumni in their careers, feedback from employers, and the enduring influence on students' professional trajectories. Furthermore, it is crucial to validate and adapt this scale to various cultural and institutional contexts in order to assure its global applicability. The development of a more comprehensive and versatile measurement scale will empower higher education institutions to continuously improve the services provided by student career centers, ultimately contributing to the career success of their students.

REFERENCES

[1] H. de Wit and L. Deca, "Internationalization of higher education, challenges and opportunities for the next decade," in *European higher education area: challenges for a new decade*, A. Curaj, L. Deca, and R. Pricopie, Eds. Cham: Springer International Publishing, 2020, pp. 3–11, doi: 10.1007/978-3-030-56316-5_1.

[2] S. E. Sullivan and A. Al Ariss, "Making sense of different perspectives on career transitions: a review and agenda for future research," *Human Resource Management Review*, vol. 31, no. 1, p. 100727, Mar. 2021, doi: 10.1016/j.hrmr.2019.100727.

[3] L. Li, "Reskilling and upskilling the future-ready workforce for industry 4.0 and beyond," *Information Systems Frontiers*, pp. 1–16, Jul. 2022, doi: 10.1007/s10796-022-10308-y.

[4] L. Andrewartha and A. Harvey, "Employability and student equity in higher education: the role of university careers services," *Australian Journal of Career Development*, vol. 26, no. 2, pp. 71–80, Jul. 2017, doi: 10.1177/1038416217718365.

[5] X. Xing, M. Huerta, and T. Garza, "College and career preparation activities and their influence on post-high school education and work attainment," *Journal of Career and Technical Education*, vol. 34, no. 1, pp. 8–28, Dec. 2019, doi: 10.21061/jcte.v34i1.a1.

[6] H. F. El-Sofany and S. A. El-Seoud, "The implementation of career and educational guidance system (CEGS) as a cloud service," *International Journal of Emerging Technologies in Learning (iJET)*, vol. 15, no. 20, pp. 226–240, Oct. 2020, doi: 10.3991/ijet.v15i20.16839.

[7] R. Helens-Hart, "Career education discourse: promoting student employability in a university career center," *Qualitative Research in Education*, vol. 8, no. 1, pp. 1–26, Feb. 2019, doi: 10.17583/qre.2019.3706.

[8] J. L. Brown, M. Healy, T. McCredie, and P. McIlveen, "Career services in Australian higher education: aligning the training of practitioners to contemporary practice," *Journal of Higher Education Policy and Management*, vol. 41, no. 5, pp. 518–533, Sep. 2019, doi: 10.1080/1360080X.2019.1646380.

[9] C. Y. Cruzvergara, J. A. Testani, and K. K. Smith, "Leadership competency expectations of employers and the expanding mission of career centers," *New Directions for Student Leadership*, vol. 2018, no. 157, pp. 27–37, Mar. 2018, doi: 10.1002/yd.20277.

[10] A. Usher, A. Kwong, and J. Mentanko, *Career services offices: a look at universities and colleges across Canada*. Toronto: Higher Education Strategy Associates, 2014.

[11] J. M. Despeaux, H. G. Knotts, and J. S. Schiff, "The power of partnerships: exploring the relationship between campus career centers and political science departments," *Journal of Political Science Education*, vol. 10, no. 1, pp. 37–47, Jan. 2014, doi: 10.1080/15512169.2013.860877.

[12] R. Cheung and Q. Jin, "Impact of a career exploration course on career decision making, adaptability, and relational support in Hong Kong," *Journal of Career Assessment*, vol. 24, no. 3, pp. 481–496, Aug. 2016, doi: 10.1177/1069072715599390.

[13] R. Kirilov, "Challenges in building the administrative capacity of career centers in higher education institutions," *Trakia Journal of Sciences*, vol. 17, no. Suppl.1, pp. 60–63, 2019, doi: 10.15547/tjs.2019.s.01.011.

[14] I. Stonebraker, C. Maybee, and J. Chapman, "Undergraduate students' experiences of using information at the career fair: a phenomenographic study conducted by the libraries and career center," *The Journal of Academic Librarianship*, vol. 45, no. 4, pp. 358–367, Jul. 2019, doi: 10.1016/j.acalib.2019.05.002.

[15] K. Choudhury, "Evaluating customer-perceived service quality in business management education in India," *Asia Pacific Journal of Marketing and Logistics*, vol. 27, no. 2, pp. 208–225, Apr. 2015, doi: 10.1108/APJML-04-2014-0065.

[16] C. Terzaroli and Y. Oyekunle, "Career service as a measure to support employability: a comparison between University of Florence and University of Lagos," *Andragoška spoznanja*, vol. 25, no. 1, pp. 89–110, Feb. 2019, doi: 10.4312/as.25.1.89-110.

[17] J. Schlesinger, C. O'Shea, and J. Blesso, "Undergraduate student career development and career center services: faculty perspectives," *The Career Development Quarterly*, vol. 69, no. 2, pp. 145–157, Jun. 2021, doi: 10.1002/cdq.12255.

[18] J. Y. Lee, C. L. Chen, E. Kolokowsky, S. Hong, J. T. Siegel, and S. I. Donaldson, "Development and validation of the career crafting assessment (CCA)," *Journal of Career Assessment*, vol. 29, no. 4, pp. 717–736, Nov. 2021, doi: 10.1177/10690727211002565.

[19] A. Olive, H. S. Chen, K. Severt, and K. Bissel, "Campus recruiting service quality: understanding college recruiters' experience during campus visits," *Journal of Tourism and Hospitality Management*, vol. 9, no. 2, pp. 83–95, 2021, doi: 10.17265/2328-2169/2021.02.002.

[20] M. P. Manlagaylay and L. E. Añar, "Career development and job placement services in higher education institution," *Asia Pacific Journal of Social and Behavioral Sciences*, vol. 20, pp. 101–118, Dec. 2022, doi: 10.57200/apjsbs.v20i0.302.

[21] M. A. Adha, A. Wibowo, R. Faslah, N. S. Ariyanti, and A. Lutfia, "Students' ideal career in the 4.0 Industrial," *Journal of Eastern European and Central Asian Research (JEECAR)*, vol. 9, no. 4, pp. 651–664, Sep. 2022, doi: 10.15549/jeecar.v9i4.928.

[22] Y.-Y. Chang and M.-H. Chen, "Creative entrepreneurs' creativity, opportunity recognition, and career success: is resource availability a double-edged sword?" *European Management Journal*, vol. 38, no. 5, pp. 750–762, Oct. 2020, doi: 10.1016/j.emj.2020.03.004.

[23] J. Memon, M. Z. A. Rozan, K. Ismail, M. Uddin, and D. Daud, "Mentoring an entrepreneur: guide for a mentor," *SAGE Open*, vol. 5, no. 1, p. 215824401556966, Mar. 2015, doi: 10.1177/2158244015569666.

[24] Y. You, F. Zhu, and X. Ding, "College student entrepreneurship in China: results from a national survey of directors of career services in Chinese higher education institutions," *Current Issues in Comparative Education*, vol. 19, no. 2, pp. 64–83, Jan. 2017, doi: 10.52214/cice.v19i2.11542.

[25] S. Jansen, T. van de Zande, S. Brinkkemper, E. Stam, and V. Varma, "How education, stimulation, and incubation encourage student entrepreneurship: observations from MIT, IIIT, and Utrecht University," *The International Journal of Management Education*, vol. 13, no. 2, pp. 170–181, Jul. 2015, doi: 10.1016/j.ijme.2015.03.001.

[26] N. E. Rahayu and E. A. Sudaryono, "Intellectual capital disclosure on website of Indonesian state universities based on management pattern: is there any comparison?" *European Journal of Business and Management Research*, vol. 7, no. 5, pp. 118–124, Oct. 2022, doi: 10.24018/ejbmr.2022.7.5.1650.

[27] Burhanuddin, "The scale of school organizational culture in Indonesia," *International Journal of Educational Management*, vol. 33, no. 7, pp. 1582–1595, Nov. 2019, doi: 10.1108/IJEM-01-2018-0030.

[28] M. M. Harun, W. M. W. Jaafar, A. Ismail, and S. M. Noah, "Reliability and validity of adapted cross-cultural counselling inventory-revised on the sample of undergraduate counsellor trainees," *International Journal of Evaluation and Research in Education (IJERE)*, vol. 11, no. 4, pp. 1861–1872, Dec. 2022, doi: 10.11591/ijere.v11i4.22510.

[29] A. Nurabadi, F. Suhariadi, A. Mardiyanta, T. Triwiyanto, and M. A. Adha, "Digital principal instructional leadership in new normal era," *International Journal of Evaluation and Research in Education (IJERE)*, vol. 11, no. 3, pp. 1090–1098, Sep. 2022, doi: 10.11591/ijere.v11i3.22483.

[30] G. S. Collins, E. O. Ogundimu, and D. G. Altman, "Sample size considerations for the external validation of a multivariable prognostic model: a resampling study," *Statistics in Medicine*, vol. 35, no. 2, pp. 214–226, Jan. 2016, doi: 10.1002/sim.6787.

[31] P. M. Podsakoff, N. P. Podsakoff, L. J. Williams, C. Huang, and J. Yang, "Common method bias: it's bad, it's complex, it's widespread, and it's not easy to fix," *Annual Review of Organizational Psychology and Organizational Behavior*, vol. 11, no. 1, pp. 17–61, Jan. 2024, doi: 10.1146/annurev-orgpsych-110721-040030.
[32] I. A. Abdelmalek and S. Houfaidi, "Developing a measurement scale of the public sector's ability to adopt lean," *Public Organization Review*, vol. 23, no. 1, pp. 149–158, Mar. 2023, doi: 10.1007/s11115-022-00610-3.
[33] G. A. Churchill, "A paradigm for developing better measures of marketing constructs," *Journal of Marketing Research*, vol. 16, no. 1, pp. 64–73, Feb. 1979, doi: 10.1177/002224377901600110.
[34] J. F. Hair, W. C. Black, B. J. Babin, and R. E. Anderson, *Multivariate data analysis*, 8th ed. Hampshire, UK: Cengage Learning, 2016.
[35] P. M. dos Santos and M. Â. Cirillo, "Construction of the average variance extracted index for construct validation in structural equation models with adaptive regressions," *Communications in Statistics - Simulation and Computation*, vol. 52, no. 4, pp. 1639–1650, Apr. 2023, doi: 10.1080/03610918.2021.1888122.
[36] M. Rönkkö and E. Cho, "An updated guideline for assessing discriminant validity," *Organizational Research Methods*, vol. 25, no. 1, pp. 6–14, Jan. 2022, doi: 10.1177/1094428120968614.
[37] B. M. Byrne, *Structural equation modeling with EQS: basic concepts, applications, and programming*, 3rd ed. New York: Routledge, 2016, doi: 10.4324/9781315757421.
[38] T. A. Whittaker and R. E. Schumacker, *A beginner's guide to structural equation modeling*, 5th ed. New York: Routledge, 2022, doi: 10.4324/9781003044017.
[39] M. K. Cain, Z. Zhang, and K.-H. Yuan, "Univariate and multivariate skewness and kurtosis for measuring nonnormality: prevalence, influence and estimation," *Behavior Research Methods*, vol. 49, no. 5, pp. 1716–1735, Oct. 2017, doi: 10.3758/s13428-016-0814-1.
[40] B. G. Tabachnick and L. S. Fidell, *Using multivariate statistics*, 7th ed. Boston, MA: Pearson, 2018.
[41] V. Siddoo, J. Sawattawee, W. Janchai, and O. Thinnukool, "An exploratory study of digital workforce competency in Thailand," *Heliyon*, vol. 5, no. 5, p. e01723, May 2019, doi: 10.1016/j.heliyon.2019.e01723.
[42] A. Arif and M. Amirul, "Does multicultural school leadership foster a multicultural teacher culture?: the mediating role of multicultural inspiration, personality, and attitude," *European Journal of Educational Research*, vol. 11, no. 4, pp. 2387–2399, Oct. 2022, doi: 10.12973/eu-jer.11.4.2387.
[43] Y. Zhao, A. St-Louis, and R. J. Vallerand, "On the validation of the passion scale in Chinese," *Psychology of Well-Being*, vol. 5, no. 1, pp. 1–11, Dec. 2015, doi: 10.1186/s13612-015-0031-1.
[44] L. M. Thien, N. A. Razak, and T. Ramayah, "Validating teacher commitment scale using a Malaysian sample," *SAGE Open*, vol. 4, no. 2, p. 215824401453674, Jan. 2014, doi: 10.1177/2158244014536744.
[45] G. Özcan, I. Aktağ, and K. Gülözer, "Developing the scale on discipline expectations of students: a validity and reliability study," *International Journal of Evaluation and Research in Education (IJERE)*, vol. 9, no. 4, pp. 840–846, Dec. 2020, doi: 10.11591/ijere.v9i4.20585.
[46] F. Dey and C. Y. Cruzvergara, "Evolution of career services in higher education," *New Directions for Student Services*, vol. 2014, no. 148, pp. 5–18, Dec. 2014, doi: 10.1002/ss.20105.
[47] B. M. Vinson, R. C. Reardon, and S. C. Bertoch, "Career services at colleges and universities: a 30-year replication study," *Journal of College Student Development*, vol. 55, no. 2, pp. 203–207, Mar. 2014, doi: 10.1353/csd.2014.0018.
[48] Maisyaroh *et al.*, "Assessment the effectiveness of using websites for principal skills training in facilitating freedom to learn," in *2022 8th International Conference on Education and Technology (ICET)*, Oct. 2022, pp. 304–308, doi: 10.1109/ICET56879.2022.9990655.
[49] T. T. H. Ho, V. H. Le, D. T. Nguyen, C. T. P. Nguyen, and H. T. T. Nguyen, "Effects of career development learning on students' perceived employability: a longitudinal study," *Higher Education*, vol. 86, no. 2, pp. 297–315, Aug. 2023, doi: 10.1007/s10734-022-00933-6.
[50] J. Y. Lee and S. J. Patel, "An innovating business model for the higher education sector: a platform-based approach to university career services," *Industry and Higher Education*, vol. 34, no. 2, pp. 91–99, Apr. 2020, doi: 10.1177/0950422219881069.
[51] G. Zahid, "Role of career education advisor/expert and teaching quality in student employability skills as the outcome of higher education," *Mediterranean Journal of Social Sciences*, vol. 5, no. 27, pp. 669–674, Dec. 2014, doi: 10.5901/mjss.2014.v5n27p669.
[52] W. E. Donald, M. J. Ashleigh, and Y. Baruch, "Students' perceptions of education and employability: facilitating career transition from higher education into the labor market," *Career Development International*, vol. 23, no. 5, pp. 513–540, Sep. 2018, doi: 10.1108/CDI-09-2017-0171.
[53] W. E. Donald, M. J. Ashleigh, and Y. Baruch, "The university-to-work transition: responses of universities and organizations to the COVID-19 pandemic," *Personnel Review*, vol. 51, no. 9, pp. 2201–2221, Dec. 2022, doi: 10.1108/PR-03-2021-0170.
[54] M. Y. Chin, C. A. B. Cohen, and M. T. Hora, "Examining US business undergraduates' use of career information sources during career exploration," *Education + Training*, vol. 62, no. 1, pp. 15–30, Dec. 2019, doi: 10.1108/ET-05-2019-0103.
[55] E. Davis *et al.*, "Utilization and impact of career services among collegiate athletes," *Journal of Athlete Development and Experience*, vol. 4, no. 3, pp. 1–19, Nov. 2022, doi: 10.25035/jade.04.03.03.
[56] P. C. Lee, M. J. Lee, and L. R. Dopson, "Who influences college students' career choices? An empirical study of hospitality management students," *Journal of Hospitality & Tourism Education*, vol. 31, no. 2, pp. 74–86, Apr. 2019, doi: 10.1080/10963758.2018.1485497.
[57] A. Hirschi, "The fourth industrial revolution: issues and implications for career research and practice," *The Career Development Quarterly*, vol. 66, no. 3, pp. 192–204, Sep. 2018, doi: 10.1002/cdq.12142.
[58] R. W. Lent, "Future of work in the digital world: preparing for instability and opportunity," *The Career Development Quarterly*, vol. 66, no. 3, pp. 205–219, Sep. 2018, doi: 10.1002/cdq.12143.
[59] M. A. Adha, H. Eryanto, N. S. Ariyanti, A. A. Musadad, A. M. Musyaffi, and A. Wibowo, "Evaluating the structural effect of family support and entrepreneurship training on entrepreneurship intention among Indonesian university students," *International Journal of Educational Methodology*, vol. 9, no. 1, pp. 227–236, Feb. 2023, doi: 10.12973/ijem.9.1.227.
[60] Y. E. Sirin, "Coaches' perceptions and intentions towards entrepreneurship," *Journal of Education and Learning*, vol. 8, no. 2, pp. 271–278, 2019, doi: 10.5539/jel.v8n2p271.
[61] G. A. Callanan and M. Zimmerman, "To be or not to be an entrepreneur: applying a normative model to career decisions," *Journal of Career Development*, vol. 43, no. 5, pp. 447–461, Oct. 2016, doi: 10.1177/0894845316633525.
[62] M. A. Adha, A. M. Musyaffi, N. S. Ariyanti, R. Ansar, and E. A. Wibawa, "Authoritative parenting styles as antecedent of entrepreneurial intentions for vocational high school students," *Journal of Community Positive Practices*, vol. 24, no. 4, pp. 95–114, Dec. 2023, doi: 10.35782/JCPP.2023.4.06.
[63] P. R. J. M. Garcia, S. L. D. Restubog, P. Bordia, S. Bordia, and R. E. O. Roxas, "Career optimism: the roles of contextual support and career decision-making self-efficacy," *Journal of Vocational Behavior*, vol. 88, pp. 10–18, Jun. 2015, doi: 10.1016/j.jvb.2015.02.004.
[64] Y. Engel, E. van Burg, E. Kleijn, and S. N. Khapova, "Past career in future thinking: how career management practices shape entrepreneurial decision making," *Strategic Entrepreneurship Journal*, vol. 11, no. 2, pp. 122–144, Jun. 2017, doi: 10.1002/sej.1243.

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