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Relationship between Mentors' Roles and Mentees' Leadership Development: The Mediating Role of Mentees' Self-efficacy

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Abstract: Limited latest studies circulated in the 21st century of world university ranking reveal that well-designed mentoring programs will not increase mentees' leadership development if mentors have not implemented effective roles in the mentoring programs. Although many studies have been done, the mediating effect of mentors' roles is little known in the tertiary education mentoring research literature. This study is done to examine the correlation between mentors' roles, mentees' self-efficacy, and mentees' leadership development. This study employed a cross-sectional research design. A purposive sampling plan was employed to collect 761 survey questionnaires from undergraduate students at non-research-based public universities in Sarawak. The survey data were analyzed by the SmartPLS package to determine the validity and reliability of the study instrument, and thus test hypotheses for the direct effects model and mediating model. The outcomes of the SmartPLS path model analysis showed that the majority of participants felt that the levels of information exchange, help, self-efficacy, and leadership development are high. This situation explains that the ability of mentors to appropriately implement information exchange and help in mentoring programs has strongly evoked mentees' self-efficacy. Consequently, this self-efficacy can lead to higher leadership development. This finding can help practitioners to understand the diverse paradigms of mentees' self-efficacy concept and plan the integration of academic and social-based approaches in formulating mentoring programs to prepare successful graduates in a time of rapid global change.

Keywords: *Mentees' leadership development, mentees' self-efficacy, mentors' roles.*

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Introduction

Undergraduate student leadership development has recently been a major focus of higher education mentoring, as practiced by the leadership of the institutions to equip them with leadership qualities and facilitate them to practice leadership roles in the institutions' social and community service programs (Ismail et al., 2021; Tinoco-Giraldo et al., 2020). This effort is very useful to help mentees achieve their objectives (Ismail et al., 2017), prepare mentees for their transition to the new world of work (Schlesinger et al., 2021), face the rapid global changes, and handle the demands of knowledgeable societies (Baroudi & David, 2020; Yue & Ye, 2022).

Numerous tertiary education mentoring studies have shown that the significant antecedents of mentee leadership development are personal factors (e.g., race, gender, year of study, self-efficacy, and emotions) (Hernandez et al., 2017; Kamali Arslantaş & Kocagöz, 2021; Salas et al., 2014) and contextual factors (e.g., education system and university environment) (Crisp, 2016; Tinoco-Giraldo et al., 2020; Tominaga & Kogo, 2018;). The importance of such antecedents is widely acknowledged, but only a few recently published studies have evaluated the specific effect of mentors' roles (Chelberg & Bosman, 2020; Napierkowski & Migliore, 2022). Mentors are generally responsible to carry out important roles as a teacher, sponsor, advisor, agent, role model, coach, and confidante in formal and informal mentoring relationships (Ismail et al., 2021; Tobin, 2004).

The significant mentors' roles are widely recognized as cutting-edge tertiary education student development programs. A review of the recent studies on the tertiary education system shows that the aims of well-formulated mentoring

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programs will not be achieved if mentors have not implemented effective roles in the mentoring programs (Chelberg & Bosman, 2020; Nikoçeviq-Kurti, 2022). Effective mentors have sufficient abilities to implement information exchange and provide sufficient help in structured and unstructured mentoring programs. Mentors' information exchange is often defined as mentors (e.g., faculty lecturers) are willing to share the various types of information concerning education, personal, social, and employment issues that are openly shared between mentors with mentees (e.g., faculty undergraduate students) in face-to-face and/or online mentoring methods. This exchange may help mentees to achieve their needs and expectations, by improving their study achievements, satisfying their career interests, and upgrading their psychosocial and leadership skills (Ismail et al., 2017; Kanten et al., 2017; Napierkowski & Migliore, 2022).

Mentors' help is usually defined as mentors (e.g., faculty lecturers) providing numerous educational support in terms of moral aid (e.g., awareness, inspiration, compassion, resilience, and caring) and material aid (e.g., time management skills, study techniques, social adaptability skills, problem-solving techniques, and lending some money) to assist mentees (e.g., faculty undergraduate students) in carrying out their tasks and responsibilities effectively (Chelberg & Bosman, 2020; Napierkowski & Migliore, 2022), by promoting their academic performance, fulfilling their career interests, and upgrading personal and professional development (Andersen & West, 2020; Kanten et al., 2017; Nikoçeviq-Kurti, 2022).

Recent university mentoring studies acknowledge that the ability of mentors to deliver information exchange and provide sufficient help may have a significant impact on mentee outcomes by enhancing their self-efficacy (Chelberg & Bosman, 2020; Ismail et al., 2015;) and leadership development (Napierkowski & Migliore, 2022; Yue & Ye, 2022). Self-efficacy is grounded in the Social Cognitive Theory (Bandura, 1994), which states that "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives". It consists of two different levels: persons with high self-efficacy and persons with low self-efficacy (Bandura, 1994). From a tertiary education mentoring perspective, mentees with high self-efficacy can carry out challenging responsibilities, learn skills and inculcate positive personal attributes, as well as attain mentoring results (Lejonberg & Tiplic, 2016; van Dinther et al., 2011). While, mentees with low self-efficacy are not able to apply knowledge and skills in performing difficult tasks, find reasons for completing challenging tasks, and learn new knowledge, attitudes, and behavior in tertiary education institutions (Pajares & Schunk, 2005; Rayle et al., 2006).

Hence, mentees' leadership development is frequently defined as a high desire of undergraduate students to impart leadership qualities (e.g., technical skills and soft skills) by actively being involved in tertiary education co-curricular activities, especially mentoring programs (Napierkowski & Migliore, 2022; Yue & Ye, 2022). According to the Social Change Model of Leadership (Astin & Astin, 1996), students' leadership development is affected by their institution programs, where they are taught to link their core leadership values with social responsibility at three levels, namely individual level (consciousness of self, congruence, and commitment), group level (common purpose, collaboration, and controversy with civility), and community/societal level (citizenship). This exposure may foster positive social change (Dugan, 2006; Dugan & Komives, 2007). Leadership development based on social change equips mentees with socialization skills (e.g., adjusting to a new organization or role), personal attributes (e.g., communication, helping others, integrity, and honesty), and ethical reasoning and moralities (e.g., respect the rights and wrongs in the intellectual work) (Baroudi & David, 2020; Yue & Ye, 2022).

Surprisingly, mentees' self-efficacy has been a remarkable issue when some of the latest tertiary education mentoring studies published in the 21st century reveal that the effect of mentors' roles on mentees' leadership development is indirectly influenced by mentees' self-efficacy (Byrne et al., 2022; Propst & Koesler, 1998). Even though many studies have been done, the effect size and nature of mentees' self-efficacy as an essential mediating variable is largely neglected in the tertiary education mentoring research literature, where further examination of this issue is crucial (Baroudi & David, 2020; Yue & Ye, 2022).

To address these gaps, many researchers debate that this condition is probably attributed to many factors. First, many previous studies have used a univariate model, by explaining the similarities and differences of university mentoring characteristics, such as definitions, objectives, types, and the importance of the concepts in public and private universities (Abdullah et al., 2015; Andersen & West, 2020). Second, many past studies have used a simple causal model that analyzes the associations between influential construct and effect construct: a) between mentoring programs and mentees' self-efficacy (Chelberg & Bosman, 2020); and b) between mentoring programs and mentees' leadership development (Akyavuz & Asici, 2021). This model was tested using simple behavioral statistical tools (e.g., descriptive, and bivariate statistics) where the results of this test could only identify the strength and nature of the association between the study constructs. However, the effect size and nature of mentees' self-efficacy as an essential mediating variable are neglected in the model analysis (Akyavuz & Asici, 2021; Chelberg & Bosman, 2020).

This study provides three important contributions to the existing literature. First, it contributes to previous university mentoring studies by promoting mentors' roles as more important enhancers rather than mentees' traits and general contextual factors, whereby mentors' information exchange and help act as significant antecedents of mentee outcomes (Yue & Ye, 2022). Second, this study extends the mentee success literature by exploring mentors' roles as a major determinant, which has not been thoroughly examined thus far. It is significant to mention that mentors' roles may directly upgrade mentees' self-efficacy (Chelberg & Bosman, 2020) and mentees' leadership development (Baroudi &

David, 2020). Third, this is the first initiative to specifically assess the effect of combined dimensions of mentors' roles as antecedents of mentee outcomes, disclosing that mentees' self-efficacy and leadership development are strongly affected by two major dimensions, namely mentors' information exchange, and help (Napierkowski & Migliore, 2022). Finally, this study improves the limitations of prior research models using the mediating model. This model is developed based on the main idea of Bandura's (1977) Self-Efficacy Theory, which predicts that social persuasion elements, such as mentors' roles can indirectly influence mentees' leadership development through mentees' self-efficacy (Byrne et al., 2022). The evidence justifies testing a model where mentees' self-efficacy will be the essential mediating variable in such relationships.

This study context is mentoring programs at Malaysian public tertiary education institutions. These mentoring programs are used to complement formal teaching and learning programs to produce balanced and holistic graduates with an entrepreneurial mindset, and work creators, and cultivate lifelong learning to face the 21st century of global market challenges and difficulties (Ministry of Higher Education Malaysia, 2015). To meet this purpose, leaders of faculties, schools, and academic departments in tertiary education institutions have been given discretionary power to formulate specific mentoring tactics and strategies (specific objectives, content, implementation modes, and procedures), such as appointing internal mentors (e.g., lecturers), external mentors (e.g., industrialists and/or professional trainers from outside their centers and universities), assign mentees to their mentors, and implement structured and unstructured mentoring methods (Abdullah et al., 2015). Previous studies about Malaysian public tertiary education mentoring show that the willingness of mentors to spend a lot of their time and energies to practice informational exchange and help have upgraded positive mentee outcomes, by promoting self-efficacy (e.g., increasing students' belief in their capabilities to improve academic studies, and adapt with campus life challenges) (Ismail et al., 2015; Poh & Kanesan Abdullah, 2019), and leadership development (e.g., joint students associations and voluntarily community services) (e.g., Bagheri et al., 2013; Noori, 2021; Said et al., 2013). This relationship has widely been examined, but the mediating role of mentees' self-efficacy between such variables is little discussed due to the paucity of empirical studies in the context of this study. Thus, further exploration of this issue is imperative.

This study has developed hypotheses based on the relevant theories and empirical studies pertaining to tertiary education mentoring. This evidence has been used to discover and predict the relationship between mentors' roles, mentees' self-efficacy, and mentees' leadership development. The influence of mentors' information exchange in upgrading mentee outcomes is consistent with the principal meaning of adult communication theory. For example, Communication Accommodation Theory (Giles, 1973; Giles & Ogay, 2007) reveals that convergent-based information exchange is normally used to strengthen social integration and approval among group members, and divergent-based information exchange is often applied to create differences and distance among group members. Further, the theory is expanded by Coupland et al. (1988) in which discourse management is frequently used to exchange information for improving social relationships among group members, while interpersonal control is always applied to exchange information for decreasing differences and forging comfortable interactions between group members. The application of these theories in tertiary education mentoring indicates the essence of communication accommodation is often translated as mentors' information exchange (Napierkowski & Migliore, 2022; Villa et al., 2022).

The principal meaning of the theories is strongly supported by the previous tertiary education mentoring studies, which disclose that mentors had often exchanged information with mentees by explaining the mentoring's goals, content, procedures, and advantages to mentees, discussing mentees' tasks and responsibilities, and providing periodic performance feedback to mentees (Ismail et al., 2015), giving verbal encouragement, providing new knowledge and skills that meet mentees' needs, and strengthening good relationships with mentees (Baroudi & David, 2020), willing to discuss mentees' social issues and challenging matters, and proposing possible problem-solving techniques (Yue & Ye, 2022), giving advice about mentees' study responsibilities (Napierkowski & Migliore, 2022), suggesting approachable techniques to accomplish students' goals (Chelberg & Bosman, 2020), and using storytelling and active listening to improve student performance (Villa et al., 2022). Consequently, this exchange practice could lead to greater positive mentee outcomes, such as self-efficacy (Chelberg & Bosman, 2020; Ismail et al., 2015; Villa et al., 2022), and leadership development (Baroudi & David, 2020; Napierkowski & Migliore, 2022; Yue & Ye, 2022). Thus, the hypotheses are developed as follows:

H1: Mentors' information exchange positively affects mentees' self-efficacy.

H2: Mentors' information exchange positively affects mentees' leadership development.

The effect of mentors' help in enhancing mentee outcomes is in line with the notion of adult learning theory. For example, Social Integration Theory (Tinto, 1975) describes that mentoring is an important intra-institutional factor where it may aid students to assimilate into the university environment (social integration), upgrade their persistence in performing responsibilities, and ultimately accomplish their objectives. While, Early Adult Transition Model (Levinson, 1978) explains that psychological and physiological aid from an experienced and knowledgeable person is necessary to facilitate a healthy transition for a person from childhood (dependent on his/her family) to adulthood (independent from his/her family). This aid may assist adults to understand their main duties and responsibilities, as well as more confidence in handling new lifestyles and confronting dysfunctional conflicts in daily life. The use of these theories in

tertiary education mentoring shows that the essence of social aid is often interpreted as mentors' help (Napierkowski & Migliore, 2022; Yue & Ye, 2022).

The notion of these theories has received significant support from the tertiary education mentoring studies, which reveal that mentors had normally provided different forms of help to mentees by providing intrinsic and extrinsic motivation, opinions, praise, and aid to mentees (Ismail et al., 2015), inspiring, guiding and facilitating mentees to build personal and leadership development (Campbell et al., 2012), sharing explicit and tacit knowledge with mentees, using teaching experiences to develop mentees as role models, and guiding mentees to improve organizational and leadership skills (Baroudi & David, 2020), teaching mentees to improve social skills through involvement in student associations and community service projects voluntarily (Yue & Ye, 2022), and building a conducive atmosphere to promote mentees' self-esteem and confidence about their abilities to perform responsibilities for the long-term success (Napierkowski & Migliore, 2022), concerning with mentees' needs and provide some financial aid (Chelberg & Bosman, 2020), establishing a friendly and supportive rapport with mentees, raising mentees' awareness about studies, sharing expertise to increase mentees' professional development beyond learning in the classrooms, establishing student connections with peers, and providing encouragement and a sense of belief in solving distressful situations (Nikočević-Kurti, 2022). As a result, the forms of such help provided can lead to higher positive mentee outcomes, especially self-efficacy (Chelberg & Bosman, 2020; Ismail et al., 2015; Nikočević-Kurti, 2022), and leadership development (Baroudi & David, 2020; Campbell et al., 2012; Napierkowski & Migliore, 2022; Yue & Ye, 2022). Thus, the hypotheses are established as follows:

H3: Mentors' help positively affect mentees' self-efficacy.

H4: Mentors' help positively affect mentees' leadership development.

The correlation between mentors' roles, mentees' self-efficacy, and mentees' leadership development is consistent with the essence of Bandura's (1977) Self-Efficacy Theory, which posits that self-efficacy is a situation-specific and not a global personality trait, where individuals who have a high belief in their capabilities can successfully execute their actions to accomplish intended results in a particular condition. Application of the theory in tertiary education mentoring displays that the essence of mentees' self-efficacy is a strong enhancer of mentees' leadership development, and an essential mediating variable in the relationship between mentors' roles and mentees' leadership development (Byrne et al., 2022; Propst & Koesler, 1998). Thus, the hypotheses are formulated as follows:

H5: Mentees' self-efficacy positively affect mentees' leadership development.

Some empirical evidence support that the effect of mentors' roles and mentees' leadership development is mediated by mentees' self-efficacy. For example, a survey by Propst and Koesler (1998) used a sample of 194 National Outdoor Leadership School (NOLS) course students in Wyoming, US showed that the capability of mentors to openly share valuable information (e.g., the mentoring goals and benefits, techniques, and periodic performance feedback), and provide useful help (e.g., exhibit a role model admired by mentees) in structured and unstructured mentoring modes had strongly evoked mentees' self-efficacy, which in turn might lead to greater leadership development. Conversely, Byrne et al. (2022) surveyed 79 American undergraduates and found that the ability of mentors to openly exchange useful information with mentees (e.g., sharing knowledge and skills, as well as periodic performance feedback), and provide useful help (e.g., supporting active learning through interactive learning, instructional planning, facilitation, and design) in formal and informal mentoring methods had firmly invoked mentees' self-efficacy. Consequently, this efficacy could lead to higher leadership development. Thus, the hypotheses are constructed as follows:

H6: Relationship between mentors' information exchange and mentees' self-efficacy positively impact mentees' leadership development.

H7: Relationship between mentors' help and mentees' self-efficacy positively impact mentees' leadership development.

The theoretical and empirical evidence as described in the research literature have been used as a foundation to formulate the study model as exhibited in Figure 1. This model shows two significant relationships: First, direct effect of mentors' roles on mentees' self-efficacy and leadership development. Second, mediating effect of mentees' self-efficacy between mentors' roles and mentees' leadership development.

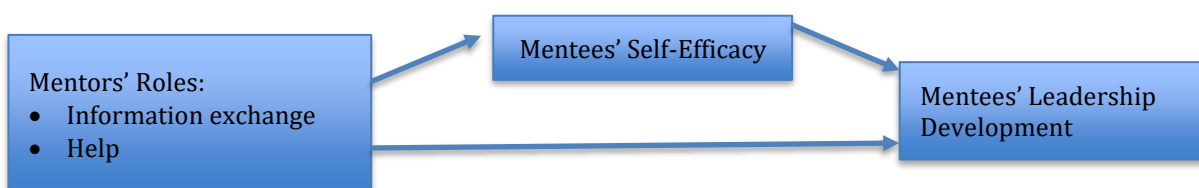


Figure 1. Independent Variable Mediating Variable Dependent Variable

Methodology

Research Design

A cross-sectional research design is a quantitative method, which it is suitable to collect survey questionnaires from a particular subject group at one point in time (Schmidt & Brown, 2019). This procedure is able to help the researchers to collect relevant data, less biased data and high-quality data from a larger population within a short time (Sekaran & Bougie, 2016). Hair et al.'s (2017) data analysis procedure was used as a guideline to evaluate the quality of the measurement model (relationship between items and constructs). In this measurement model, descriptive statistics were utilized to perform data screening by the SPSS package, and confirmatory factor analysis was further executed by the SmartPLS package. Next, after the quality of the measurement model was achieved, the structural model (relationship between constructs) was tested using the SmartPLS path analysis model (structural equation modeling). This analysis is implemented to test the direct effects model and mediating model. The direct effects model was first tested to determine the direct effect of mentors' roles on mentees' self-efficacy and leadership development. Further, the mediating model was tested to quantify the effect size and nature of mentees' self-efficacy as a vital mediating variable between mentors' roles and mentees' leadership development.

Sample and Data Collection

The target population was undergraduate students at non-research-based public universities in Sarawak. A purposive sampling plan was used to distribute 1,000 self-administered questionnaires to the students. This sampling plan was chosen because the management of universities had not provided a complete list of registered undergraduate students for confidential reasons. This constraint did not allow the researcher to select the study sample using a random technique. From the number, only 761 (76.1%) usable questionnaires were returned to the researchers. The majority of respondents were females (70.8%), aged between 22-24 years old (52.6%), Malaysian higher school certificate holders (43%), third-year students (38%), cumulative grade point average holders from 2.51 to 3.00 (38.6%), bachelor program students (69.9%), and male mentors (39.6%).

The survey questionnaire was drafted according to the university mentoring literature. To maintain the consistency of the question meanings, a back translation method was used to translate the questionnaire into English and Malay languages (Brislin, 1970). The survey questionnaire had three parts: First, mentors' roles (MTR) consisted of two sub-variables: information exchange (INC) and help (ELP). INC had 5 items adapted from the tertiary institution mentoring information exchange literature (Ismail et al., 2021). Dimensions of this variable were explanation, discussion, and feedback. While, ELP had 10 items adapted from the tertiary institution mentoring support literature (Ismail et al., 2021; Rayle et al., 2006). Dimensions of this variable were moral aid and material aid.

Second, mentees' self-efficacy (EFF) had 10 items adapted from the tertiary institution undergraduate students' self-efficacy literature (Bandura, 1977, 1994; Pajares & Schunk, 2005; Propst & Koesler, 1998). Dimensions of this variable were mentees' beliefs to improve study performance, communication skills, personal life, and social relationship. Finally, mentees' leadership development (LDP) had 8 items adapted from the tertiary institution undergraduate students' leadership development literature (Astin & Astin, 1996; Byrne et al., 2022; Dugan & Komives, 2007; Yue & Ye, 2022). Dimensions of this variable were mentees know how to solve problems, play a role model, make decisions, and provide caring. These items were assessed using a seven-item Likert scale ranging from "strongly disagree/dissatisfied" (1) to "strongly agree/satisfied" (7). Respondents' features were used as control variables because this study focused on the general attitudes of undergraduate students.

Data Analysis

The survey questionnaire data were analyzed according to Hair et al.'s (2017) data analysis procedure. At the initial stage of this procedure, data screening is first checked by the SPSS program to ensure the items for each construct have no missing values, extreme values, straight-lining answers, non-normal data distribution, and non-response bias. The outcomes of data screening showed three important results: First, the study questionnaire data had no missing values, extreme values, and straight-lining answers, as well as satisfied the normal data distribution assumptions (all items have Kurtosis and Skewness values less than +/-2.0). Second, the sample sufficiency was assessed according to the rule of thumb, which stated that the highest number of formative indicators in the survey questionnaire should have more than 10 times, and items for measurement models had outer loading higher than the standard threshold of 0.70 (Hair et al., 2017). The formative indicators in the questionnaire refer to 15 items that were used to measure mentors' roles. The study sample satisfied the minimum size of at least 150 respondents as determined by the rule. Finally, the response bias was assessed according to Harman's single factor test, revealing the value of variance percentage for all items was 41.52, which was less than 1.0 (Podsakoff et al., 2003), indicating that the survey questionnaire data were free from the bias problem.

Further, the SmartPLS package was used because it can analyze data simultaneously on the study model either relative or/and formative through path analysis, does not need normally distributed data, can analyze data with a small sample, and user-friendly with an attractive interface display (Hair et al., 2017). The first step of this data analysis procedure, the

quality of measurement model is evaluated using the PLS Algorithm. The analysis displays four significant outcomes: First, convergent validity is achieved if item loadings for the study variables are greater than .70, and the average variance extracted values for the study variables are higher than .50 (Henseler et al., 2009). Second, the composite reliability values for the study variables are more than .80 (Nunnally & Bernstein, 1994). Third, discriminant validity is fulfilled when the heterotrait-monotrait (HTMT) ratio of correlation values for the study variables are smaller than .90, and the confidential interval values for the study variables are lower than 1.0 (Hair et al., 2017). Finally, collinearity problem is not present if the variance inflation factor values for the correlation between the study variables are smaller than 5.0 (Hair et al., 2017).

The second part of the data analysis procedure, the structural model is tested using the Bootstrapping, Blindfolding and Important-Performance Model Analysis. This test shows six important findings: First, Bootstrapping is used to test hypotheses for the direct effects model and mediating model. Significant hypotheses are recognized when the t-value is significant ($t > 1.95$). Second, model strength is judged based on the three types of R^2 values, namely 0.26 (strong), 0.13 (moderate), and 0.02 (weak) (Cohen, 1988). Third, model fit is achieved if the value of estimated root mean residual square (SRMR) smaller than 0.08 or 10.0 (Hu & Bentler, 1999). Fourth, effect size of constructs is determined based the three categories of f^2 values: 0.35 (strong), 0.15 (medium), and 0.02 (small). Fifth, predictive accuracy is fulfilled if the blindfolding value (Q^2) is greater than zero. Finally, Importance-Performance Map Analysis (IPMA) is used to determine a crucial management problem in the hypothetical model (Hair et al., 2017).

Results

Model Measurement

Table 1 shows the item loadings for all study variables are higher than .70, and the average variance extracted (AVE) values for the study variables are greater than .50 (Henseler et al., 2009), disclosing that they have met the convergent validity standards. The composite reliability values for the study variables are bigger than .80 (Nunnally & Bernstein, 1994), revealing that the study instrument meets the internal consistency standards.

Table 1. The Results of Convergent Validity Analysis

Construct	Number of Items	Factor Loading	AVE	Composite Reliability
INC	5	.780 - .847	.666	.909
ELP	10	.739 - .805	.610	.940
EFF	10	.768 - .871	.674	.954
LDP	8	.779 - .862	.671	.942

Table 2 presents the values of heterotrait-monotrait (HTMT) ratio of correlation for the study variables are smaller than .90, and the values of confidential interval for the study variables as shown in the parenthesis are lower than 1.0 (Hair et al., 2017), revealing that all study variables have met the discriminant validity standards.

Table 2. The Results of Discriminant Validity Analyses

Construct	HTMT		
	INC	ELP	EFF
EFF	.643 (.308, .489)	.621 (.328, .520)	
LDP	.540 (.127, .295)	.525 (.105, .287)	.599 (.218, .408)

The values in the parenthesis are the values of confidential interval at 2.5% and 97.5%

Table 3 shows the means for the study variables are between 5.272 and 5.609, revealing that most respondents perceive that the levels of INC, ELP, EFF, and LDP are starting from high (4) to the highest level (7). Hence, the variance inflation factor values for the correlation between the study variables are smaller than 5.0, disclosing that the correlation has not affected by the colinearity problem (Hair et al., 2017).

Table 3. The results of variance inflation factor and descriptive statistics

Construct	Mean	Standard Deviation	Variance Inflation Factor	
			EFF	LDP
INC	5.609	.856	1.344	1.524
ELP	5.272	.981	1.344	1.766
EFF	5.410	.935		1.880
LDP	5.517	.863		

Structural Model

The structural model test presents five outcomes: First, the value of the standardized root means square residual (SRMR) is .049, which is lower than .1 (Hair et al., 2017). This result confirms that this model has a good fit. Second, the outcomes of the model strength test display that INC and ELP have explained 48 percent of the variance in EFF, which is higher than .26 (Cohen, 1988), revealing that this model has a substantial effect. INC and ELP have explained 33 percent of the variance in LDP, which is greater than .26 (Cohen, 1988), disclosing that this model has a substantial effect. EFF has explained 32 percent of the variance in LDP, which is bigger than .26 (Cohen, 1988), showing that this model has a substantial effect. The inclusion of INC, ELP, and EFF has explained 48 percent of the variance in LDP, which is greater than .26 (Cohen, 1988), disclosing that this model has a substantial effect.

Third, the outcomes of the effect size test display that the correlation between INC and EFF has an f^2 value of .24, which is bigger than .15 and lower than .35 (Hair et al., 2017), signifying that INC has a medium effect on EFF. The correlation between ELP and EFF has an f^2 value of .266, which is greater than .15 and smaller than .35 (Hair et al., 2017), revealing that ELP has a medium effect on EFF. The correlation between INC and LDP has an f^2 value of .045, which is higher than .02 and lower than .15 (Hair et al., 2017), displaying that INC has a small effect on LDP. The correlation between ELP and LDP has an f^2 value of .043, which is greater than .02 and smaller than .15 (Hair et al., 2017), showing that it has a small effect on LDP.

Fourth, the results of the predictive relevance test (Q^2) shows that EFF has a Q^2 value of .320 and LDP has a Q^2 value of .252, indicating that it has predictive relevance (Hair et al., 2017). Fifth, the outcomes of the predictive performance test show that the PLS-SEM (Q^2 -predict values = .195 to .348) and LM RMSE (Q^2 -predict values = .172 to .340) have all items are more than zero, indicating that the prediction errors are distributed symmetrically. PLS-SEM values for all items have many lower prediction errors than the item values for LM RMSE, indicating that this model has high predictive performance power (Shmueli et al., 2016).

Table 5 shows seven important results of testing the research hypotheses. First, INC is positively and significantly associated with EFF ($\beta = .396; t = 8.228$), therefore H1 is supported. Second, ELP is positively and significantly associated with EFF ($\beta = 0.417; t = 8.300$), therefore H2 is supported. Third, INC is positively and significantly associated with LDP ($\beta = .209; t = 5.180$), therefore, H3 is supported. Fourth, ELP is positively and significantly associated with LDP ($\beta = .206; t = 4.374$), therefore H4 is supported. Fifth, EFF is positively and significantly associated with LDP ($\beta = .565; t = 18.437$), therefore H4 is supported. Six, the relationship between INC and LDP is positively mediated by EFF ($\beta = .564; t = 17.755$), therefore H5 is supported. Finally, the relationship between ELP and LDP is positively mediated by EFF ($\beta = .564; t = 18.604$), therefore H7 is supported. The outcome shows that mentees' career development and mentees' leadership development are significant results of mentors' information exchange and help. Hence, the effect of mentors' information exchange and help on mentees' leadership development is positively mediated by mentees' self-efficacy.

Table 5. The Results of the Research Hypothesis Testing

Hypothesis	β	t Statistics	Result	R ²	Decision
H1: INC → EFF	.396	8.228	Supported	.480	Substantial effect
H2: ELP → EFF	.417	8.300	Supported		
H3: INC → LDP	.209	5.180	Supported	.330	Substantial effect
H4: ELP → LDP	.206	4.374	Supported		
H5: INC → LDP	.565	18.437	Supported	.565	Substantial effect
H6: INC → EFF → LDP	.396	8.513	Supported	.481	
H7: ELP → EFF → LDP	.564	8.567	Supported		Substantial effect

*significant at t statistics > 1.96 (two-tail test)

As an extension of the hypothesis testing, IPMA results show that LDP (75.375) is the highest performance and followed by EFF (73.037), and MTR (72.943). Further, MTR has been recognized as the most critical problem that should be appropriately treated to enhance the success of tertiary education mentoring programs.

Discussion

This study confirms that all hypotheses for the direct effects model and mediating model are supported. The hypothesis testing results for the direct effects model show three essential findings: First, mentors' information exchange has successfully upgraded mentees' self-efficacy and leadership development. This result is consistent with the principal meaning of adult learning theory, namely Communication Accommodation Theory (Giles, 1973; Giles & Ogay, 2007) promotes convergent-based information exchange; and Expanded Communication Accommodation Theory (Coupland et al., 1988) encourages discourse management. The use of such communication styles in exchanging mentoring information may strongly induce positive individual outcomes, by reducing divergent opinions and improving social integration among group members (Napierkowski & Migliore, 2022; Villa et al., 2022).

The principal meaning of the theories has been supported by the previous tertiary education mentoring studies, which disclose that the ability of mentors to properly execute information exchange in structured and unstructured mentoring activities may lead to higher positive mentee outcomes, such as self-efficacy (Chelberg & Bosman, 2020; Ismail et al., 2015; Villa et al., 2022), and leadership development (Baroudi & David, 2020; Napierkowski & Migliore, 2022; Yue & Ye, 2022).

Second, mentors' help has effectively enhanced mentees' self-efficacy and leadership development. This result is in line with the notion of adult learning theory, namely Social Integration Theory (Tinto, 1975) describes that help is an important intra-institutional factor; and Early Adult Transition Model (Levinson, 1978) explains that help is done in the forms of psychological and physiological support by experienced and knowledgeable persons. Execution of various help types may upgrade positive individual outcomes, by promoting social integration, understanding their main duties and responsibilities, and strengthening their confidence to handle new lifestyles and confront dysfunctional conflicts in daily life (Napierkowski & Migliore, 2022; Yue & Ye, 2022).

The notion of these theories has received significant support from tertiary education mentoring studies, which reveal that the competency of mentors to properly practice moral and material help in structured and unstructured mentoring modes can upgrade positive mentee outcomes, by promoting self-efficacy (Chelberg & Bosman, 2020; Ismail et al., 2015; Nikoçeviq-Kurti, 2022), and leadership development (Baroudi & David, 2020; Campbell et al., 2012; Napierkowski & Migliore, 2022; Yue & Ye, 2022).

The results of testing hypotheses for the mediating model display that the effect of mentors' roles on mentees' leadership development is mediated by mentees' self-efficacy. This result is consistent with the essence of Bandura's (1977) Self-Efficacy Theory, which states that individuals' high belief in their capabilities is strongly determined by social persuasion factors (e.g., mentoring) and this can strongly inspire them to accomplish their intended results in a particular condition (Chelberg & Bosman, 2020; Villa et al., 2022). This notion has received strong support from previous empirical evidence, which discloses that the capability of mentors to appropriately perform information exchange and help in structured and unstructured mentoring methods will strongly invoke mentees' self-efficacy. Consequently, this efficacy may lead to greater mentees' leadership development (Byrne et al., 2022; Propst & Koesler, 1998).

The IPMA results have recognized that mentors' roles are a crucial management problem that should be given major attention. To deal with this problem, practitioners should focus on the following aspects: Firstly, training methods and content should be revised to help mentors implement mentoring tasks effectively. For example, training content that is designed to focus on andragogy (adult learning) is very useful to increase the understanding of mentors about university students' wants, needs, and/or demands. This knowledge will help mentors to educate diverse mentees' backgrounds in structured and/or unstructured mentoring programs through systematic learning methods, namely learning by observation (e.g., mentors deliver clear information about the mentoring's procedure and goals, and road maps to increase mentees' well-being), and learning by doing (e.g., mentors allocate times and energies to inspire, guide and facilitate mentees in achieving objectives) can strongly drive mentees to meet their objectives.

Secondly, close connections between mentors and mentees should be developed based on respect, trust, honesty, cooperation, and support to promote developmental relationships. This relationship is normally practiced by face-to-face and online methods to inspire young adults to discover who they are, cultivate abilities to shape their own lives and learn how to engage with and contribute to the world around them. This initiative may cultivate mentees' abilities to become more independent, innovative, and responsible in thriving for their future careers. Thirdly, considering the limited job opportunities offered by the government sector and high competition among graduates to fulfill job vacancies in the present industry, then entrepreneurial mentoring programs should be given priority to overcome a serious unemployment problem for university students. This specific mentoring target will inspire mentors to give the most focus on upgrading mentees' latest entrepreneurial values, knowledge, and skills. As a result, this initiative can nurture mentees to become prospective entrepreneurs in the real world of work.

Finally, talented lecturers should be hired to make a significant impact on mentoring programs. Talented lecturers have distinctive competencies, such as knowledge, technical skills, cognitive and affective abilities, good moral values, and other capabilities that are consistent with changing environments. They can improve mentoring effectiveness by applying their competencies to guide and facilitate mentees in improving academic performance, linking academic knowledge to the real world of work, developing psychosocial and career advancements, and cultivating mentees to become innovative and credible future leaders in society. If the above suggestions are given more attention this can stimulate mentees to achieve their personal and tertiary education mentoring goals.

Conclusion

This study tested the study models established based on the tertiary education mentoring research literature. The measurement scale has satisfied the validity and reliability standards. The outcomes of hypothesis testing have shown that mentors' roles (information exchange and help) are significant antecedents of mentees' self-efficacy and leadership development. Hence, mentees' self-efficacy is a significant mediating variable between mentors' roles and mentees' leadership development. This outcome also is consistent with and has broadened the tertiary education mentoring

studies mostly circulated in Western and Asian countries. Therefore, current research and practice within tertiary education institutions need to consider mentees' self-efficacy as a crucial dimension of the undergraduate mentoring domain. This study further suggests that the ability of mentors to properly implement their roles will strongly invoke subsequent positive mentee outcomes (e.g., career, psychosocial, study performance, and employability). Thus, this positive outcome may lead to maintaining and enhancing the performance of tertiary education institutions in the global university ranking.

Recommendations

The study provides several important suggestions to strengthen future research. First, gender, age, education, academic discipline, academic performance, and mentor gender are critical respondents' features that should be considered because they may increase our understanding of the similarities and differences between respondents' perceptions of the correlation between the study variables. Second, longitudinal studies could be carried out in future research if we want to make a comparison between after and before the implementation of mentoring programs and keep track of the effectiveness of mentoring programs at different times. Third, private universities should be used in future research to get a better understanding of the effectiveness of mentoring programs within Malaysian tertiary education institutions. Fourth, two dimensions of mentors' roles, like participation and learning methods should be considered because they have widely been acknowledged in previous tertiary education mentoring studies as a significant antecedent of mentee outcomes. Fifth, two major types of mentees' self-efficacy, namely high self-efficacy, and low self-efficacy should be used because they are extensively recognized in past tertiary education mentoring studies as an important link between mentors' roles and mentees' leadership development. Finally, several important components of mentee outcomes such as academic achievement, career choice, and personal and professional development should be used because they have widely been discussed in previous tertiary education mentoring research reports. Thus, the importance of the above suggestions should be further advanced in future research.

Limitations

The study has some methodological and conceptual limitations. Firstly, a cross-sectional research method is only able to describe the general respondents' perceptions of the correlation between the study variables. Second, the correlation between the specific indicators for the study variables is not examined. Third, respondents' features are not used to measure the correlation between the study variables. Fourth, a purposive sampling plan does not provide sufficient data to represent the study population. Finally, public universities established by the Malaysian federal government are only used in this study. These limitations may decrease the generalizability of the study results to various kinds of tertiary education institutions.

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Authorship Contribution Statement

Aminudin and Azman: Conceptualization, design, analysis, writing, final approval, supervision, editing, reviewing, final approval. Mustafa and Azman: Writing, data acquisition, data analysis / interpretation, statistical analysis, drafting manuscript. Suja and Anis: Writing, critical revision of manuscript, statistical analysis. Aminudin: Technical and material support.

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