MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

JANUARY 2024, VOLUME 12, ISSUE 1, 29 - 42
E-ISSN NO: 2289 – 4489

DEVELOPMENT OF A RESEARCH LEADERSHIP MODEL FOR MALAYSIAN HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

Research landscape in higher educational institution such as Institute of Teacher Education, has experienced substantial changes. Due to the significant changes, present researchers require a variety of resources, in particular, financial support for their endeavors. The change is aimed at having quality research outputs. The change will be successful if it is led by a leader who applies the leadership style of research. However, research leadership is still new in Malaysia. Such style of leadership often based on the Western models. Hence, the purpose of this research is to develop a research leadership model based on the consensus of local experts. The data were collected using a multi-method research design that applies both qualitative and quantitative methods. The design is based on two phases as follows: (a) the need analysis phase that included interview sessions among three lecturers of higher education institutions in the urban area and three lecturers of higher educational institutions in the rural area. This phase is to identify a need to develop a research leadership model and (b) the development phase that included three round sessions as follows: (i) the first-round session was to collect data from the experts through interviewing sessions among seven experts. They are from various fields such as education and industry, (ii) the second-round session was to get expert reviews of the model's content, and (iii) the third-round session is to get consensuses of 23 experts from practitioner category through analyzing data using Triangular Fuzzy Numbers in applying Fuzzy Delphi technique. The research findings reported that there are five primary dimensions of the Malaysian Research Leadership Model: (a) professional leadership, (b) leading research activities, (c) creating collaborative and collective cultures, (d) leading support and (e) creating a conducive environment. The research findings have reported that it is a need to develop a model based on context as being inspired by Manning, Kinzie and Schuh (2014): *One Size Fits All*.

Keywords: **Development, Model, Research Leadership, Higher Education Institution**

INTRODUCTION

The need for leadership is constantly changing as global education changes. The evolution that has taken place in the field of leadership suggests that the concept of leadership is heavily dependent on the will of the better. Leadership plays a crucial role in the transformation of higher education institutions all around the world. It is widely believed that effective leadership is a critical factor for the success of these institutions (Salihu et al., 2020). This statement is also supported by Kujala et al., (2019) that for the long term, the concept of leadership depends on the need of the stakeholder based on the desired context. This established context will directly or indirectly affect the thinking, role and responsibility of leaders in a more complex direction. (Maak & Pless, 2006). Leadership in educational systems and organizations is often impressed by the rapid circulation that has taken place. The last few decades have shown that the concept of leadership in education has become a priority in the development of educational policy. This statement is reflected in the Malaysian Education Blueprint 2013-2025, which puts the leadership aspect of leadership as the main focus in the development of education. Through the Malaysian Education Blueprint 2015-2025 (Higher Education), the consolidation of the leadership aspect became a key attribute in the development and sustainability of higher education in Malaysia.

Research leadership is considered important especially in higher education institutions as it can help organizations make accurate decisions, based on facts and data, and can save organizational costs. Among the early researchers on research leadership was Evans (2014) looking at the aspects of effective research leadership. The effectiveness of research leadership occurs when it seeks to enhance the knowledge, understanding and skills that support the specific research process. Effective leadership is the ability to make the right decisions in the context of research.

Therefore, this study is being conducted to develop Malaysian Research Leadership Model for Higher Education Institutions. In other perspectives, research leadership is considered relevant today to developing educational organizations. Implicitly, leaders are able to develop themselves and lead research within the organization.

LITERATURE REVIEW

This section covers several aspects, including research leadership in higher education institutions and research leadership at the Malaysian higher education institution as follows.

Research Leadership in Higher Education Institutions

In the context of this study, there is a lack of reference to studies relating to the effectiveness of guidelines for the design of research leadership models. This can be seen through the research leadership effectiveness study by Evans (2014) which stated that the study was conducted based on snow balling and the researcher's own interpretation. Next, some evaluation into the research product through publication. Publishing material is considered good when more study quotes are better, but it needs to look at the content of the study. This situation refers to data in 2020 through a comparative survey by the Australian Universities that in the United Kingdom, the United States and Australia, a total of 90 percent of researchers evaluate the effectiveness of the study through study quotes. Therefore, the study data on the effectiveness of the model design is important as an indicator of efficiency. Less reference studies related to the effectiveness of the guidelines for the design of research leadership models. The research leadership effectiveness study by Evans (2014) is based on snow balling and the interpretation of the researcher.

Research Leadership at Malaysian Higher Education Institutions

Education is an essential element in the development of a country. The function of higher education institutions as the main hub of education in Malaysia can be seen through research activities. This view is consistent with the aspirations of the higher education system in the Malaysian Education Blueprint 2013-2025 (Higher Education). Malaysia's goal is to be among the top 25 countries in research success by 2025 based on the Ranking of Higher

Education System U21. Leadership in higher education institutions is seen as an important benchmark in realizing this aspiration. Ball (2007) also agreed that the role of leadership in higher education institutions was an important factor in improving the quality of education.

However, there has been a rift among faculty members in higher education institutions who see the roles of leadership and research separately. In other words, they're still away from the concept of research leadership. This statement is supported by Normah Jantan (2020), in addition to the less clear guidelines, the professors have a problem of lack of understanding about the role of leaders in research activities. Modeste et al., (2020) stated in their study that this phenomenon occurred because the guidelines provided to provide understanding related to the role of leadership in research in higher education institutions effectively were very limited.

In fact, research leadership studies in higher education institutions are still less well-established in the context of Malaysia, so most references are based on guidelines from the western country context. Esen et al., (2020) reports that most studies of leadership in higher education institutions are commonly found in literature from the United States. However, studies from the West are not considered ideal for continuing to be applied in the context of our country without first being processed in order to meet the relevance of the cultural context and values in Malaysia. This view is consistent with the one-size-fits-all approach stated through studies (such as Saiful Adli Ab Rahim, Muhammad Faizal A. Ghani, Harris Shah Abd. Hamid, Norhanida Samsudin and Zawawi Ismail, 2021; Muhammad Faizal A. Ghani and the United States. Khalil Adnan, 2015) who stated that not all appropriate studies were conducted properly carried out in different locations. The majority of the guidelines are not in line with the needs of Malaysian society because not all Western literature corresponds to studies in Malaysia, especially in terms of demographic differences, cultures, values and norms. Moreover, based on a recent study by Flinders and Anderson (2019) it can be seen that the analysis of the concept of research leadership is also inadequate. The exploration of the domains contained in the leadership of this research is less conducted by researchers (Evans, 2014).

METHODOLOGY

The section provides a description of the study methodology.

Research Design

This research was conducted using a multi-method approach that integrates qualitative and quantitative approaches, specifically using the Design and Development Research (DDR) approach. (Hesse-Biber, 2010). The study begins with a semi-structured interview method that was used to collect research data. The use of this method is in line with the views of Bogdan and Biklen (1998) who state that qualitative data is able to study a phenomenon that occurs more deeply by delving into the feelings of the study participants. Thus, Data was gathered via interview sessions with six study participants in order to determine the need to develop a research leadership model at the Institute of Teacher Education Malaysia.

The study then continued to the following phase, which is the development phase. The development phase comprises three rounds. The first round involves conducting interviews with seven panels of experts. An interview was conducted to gather an early list of themes and questionnaire items to be utilized in the subsequent phase of the investigation. Interviews are transcribed and evaluated to obtain descriptive data, which provides as the basis for developing themes and questionnaire items.

In the second round of this Delphi study method, the same expert was given a description of the procedure and purpose of the study carried out. This expert panel is given a questionnaire tool that contains an initial list of topics and items to be obtained based on previously conducted interviews. Seven-point Likert scale surveys are used.

Further, the Delphi method is used to analyze the data collected. The Delphi method is one of the best methods to get an agreement on a problem or problem that occurs. (Mohd Ridhuan Mohd Jamil & Nurulrabihah Mat Noh, 2020). The Delphi method is an effective method used in empirical investigation of a problem involving solving a problem,

generating and developing an idea and determining position and priority in the measurement of the items.

Research Sample

Need Analysis Phase. The selection of research participants for this phase is based on the justification of qualitative research that research participants are able to explain the research phenomenon. The study sample was selected based on the purposive sampling method (Merriam, 2009) to obtain direct input from the study participants. Furthermore, Creswell (2014) states that for qualitative studies, the number of participants in the range of three to 10 people is appropriate and depends on the depth of the study.

For the purposes of this phase, the selection of participants for this phase includes three criteria, which are (i) involve academic staff working at the Teacher Education Institute (Campus) in the Central Region of Peninsular Malaysia, (ii) involve academic staff graded DG41 and above (iii) volunteer to participate research. Therefore, based on this rationale, six participants in this study were selected from among the academic staff who serve at the Institute of Teacher Education (Campus) in the Central Region of Peninsular Malaysia. Further, for the purpose of determining the study sample size. A total of six academic staff were selected to be interviewed. According to Merriam and Tisdell (2015), the selection of the number of samples depends on the problem and the needs of the study. Therefore, the selection of the number of study participants is considered to be able to meet the needs of the study and obtain saturated data.

Development Phase. Next, for Delphi study participants selected in this phase consist of experts in the field of research including academicians, public sector's researcher and industrial sector's researcher. Therefore, the sample selection of the study is based on the sampling purpose by referring to individuals who have expertise in research leadership. This selection is in line with the Delbecq, Van de Ven and Gustafson (1975) proposals which list four characteristics of specialists: (i) specialists have more than five (5) years of experience in conducting research activities; (ii) experts have experience in leading research activities for more than five years; (iii) experts succeed in producing over 5 units of research output (such as publishing materials and awards); (iv) experts successfully win research grants worth more than RM 10,000; and (v) volunteers participate in this research. According to Witkin and Altschuld (1995), the sample size selection is consistent with the opinion of Ogbeifun, Agwa-Ejon, Mbohwa and Pretorius (2006), which states that there is no specific number of specified sample selection in the Dephi study, the minimum acceptable sampling size in the Delphi study is seven people. So, the researcher set the sample size used for one round of a Delphi study of seven people. Table 1 shows a list of expert selection panels for the Development Phase based on the type of institution and organization.

Table 1: *Expert Panel Selection for Development Phase (Round 1 and 2)*

Position and Organization	Number of Experts
Professor, Head of Research Centre, Low Dimensional Materials	1
Chief Engineer, R&D Product Planning (Electric Vehicle and Hybrid Research Leader)	1
Director, Centre for Social Economic Research, Market Intelligence and Agribusiness	1
Assistant Director, Centre for Social Economic Research, Market Intelligence and Agribusiness	1
Senior Professor of Automotive Engineering	1
Assistant Director, Centre for Planning, Research and Innovation	1

Senior lecturer, Faculty of Education	1
Total	**7**

Based on Table 1, a total of seven experts were selected to obtain an expert agreement on the content of the model formed. A panel of experts from the field of research including academician, public sector's researcher and industrial sector's researcher participated in first round and second round of Dephi studies.

Table 2: *Expert Panel Selection for Development Phase (Round 3)*

Position and Organization	**Number of Expert**
Professor, Head of Research Centre, Low Dimensional Materials	1
Chief Engineer, R&D Product Planning (Electric Vehicle and Hybrid Research Leader)	1
Director, Centre for Social Economic Research, Market Intelligence and Agribusiness	1
Assistant Director, Centre for Social Economic Research, Market Intelligence and Agribusiness	1
Senior Professor of Automotive Engineering	1
Assistant Director, Centre for Planning, Research and Innovation	4
Senior lecturer, Faculty of Education	9
Senior lecturer, Center for Educational Leadership Development	4
Assistant Director, Policy Sector and Planning, Inspectorate Panel, Ministry of Education Malaysia	1
Total	**23**

Furthermore, for the third round of Delphi studies in the Development Phase, 23 experts were selected on the basis of positions. Similarly, the selection of seven (7) research experts in the first and second rounds as well as 23 experts in this third round was based on the criteria outlined in the Delphi Technique. These selection criteria include individuals who are engaged in research activities at the introduction and implementation stage, have served in the field of education for more than 10 years and have more than five (5) years of research experience.

Research Instrument

Need Analysis Phase. This study was conducted using a semi-structured interview protocol. The researcher used an interview protocol to obtain research data related to research leadership challenges at the Malaysian Institute of Teacher Education. A set of interview questions containing open responses was used. For the needs of this study, the researcher used an interview instrument format adapted from the interview instrument of Muhammad Faizal A. Ghani and Gary (2013). In summary, the content of the interview protocol includes four main sections, namely (i) Section A (opening questions), (ii) Section B (transitional questions), (iii) Section C (main questions), and (iv) Section D (closing question). Section A is about the background of the participants, the background of the study. Section B covers the purpose of the study.

Development Phase. For the Development Phase, two types of instruments are used: interview protocols and questionnaire forms.

First round. A set of interview protocols that have an open response used in the first round at this stage of the study. Structured interview instrument format adapted from Muhammad Faizal A. Ghani's interview instrument. Ghani and Gary (2013) are used in producing interview protocols that contain the following sections.

Opening Question (Section A). *This question contains information about the background of the expert panel.*

Transitional Question Questions (Section B). *Descriptions relating to the purpose of the study, study methodology, the ethics of conducting the study and the approval of the expert panel to participate in the study.*

Main question (Section C). *This primary question gives rise to the primary objective of the study being carried out. Similarly, the questions asked were aimed at obtaining information and suggestions from the study participants regarding the content of the development of the research leadership model.*

Closing Question (Section D). *Questions in this section serve to give confidence to the researcher that the requested information has been obtained well in addition to containing words of appreciation and thanks.*

Second round. *Next, the construction of a semi-open questionnaire tool is used to obtain expert agreement on topics, sub-themes and initial items through interviews conducted at round one. In order to answer all built items, the expert panel should give feedback stating their level of agreement based on a seven-point Likert scale. The Likert scale of seven points for obtaining expert approval feedback is as follows.*

Likert Scale	Scale Level
7	Strongly Agree
6	Agree
5	Somewhat agree
4	Neither agree
3	Somewhat disagree
2	Disagree
1	Strongly disagree

Subsequently, the expert review and modification of the survey item is carried out to assess the contents of the poll item before being presented to the expert panel.

Third round. After that, the survey instrument is executed on top of 23 expert panel members to obtain agreement on the built item.

Data Collection Procedure

Need Analysis Phase (Qualitative Data). To fulfill the data collection for this phase, the researcher collected qualitative data. Data was obtained through interviews with six study participants. First, the researcher obtained permission to conduct the study from the Malaysian Ministry of Education through the Education Policy Planning

and Research Division (EPRD). Next, eight study participants were selected and an invitation letter was sent to them via email. After getting approval and setting a suitable date and time, the researcher conducted through the medium of Google Meet with the study participants.

Development Phase (Qualitative Data and Quantitative Data). The collection of data for the Development Phase is both qualitative and quantitative as follows.

Qualitative Data (First Round). In order to conduct the interview, the researcher first identifies individuals who are able to meet the criteria of the Delphi study expert. Subsequently, the panel of experts is contacted via phone calls and emails to participate in the study. After obtaining the approval of the panel of experts, the invitation and approval letters of membership of the expert panel in the first round of the study are delivered to the panel. The date and time of the meeting is agreed between the examiner and the study participant and stated with the invitation letter. The interview session then takes place within one to two hours of an agreed date.

Qualitative Data (Second Round). The gathering of data for the second phase of development continues to depend on the utilization of the same group of experts to get consensus on the model's content. Consequently, it is necessary for an expert to evaluate the dimensions, subdimensions, and items derived from the interview. Hence, the data collecting strategy for the research was carried out in two ways, namely in-person meetings with each expert and via online meeting.

Quantitative Data (Third Round). The Fuzzy Delphi method is used to collect qualitative data at this stage. Simultaneously, the study participants consisting of the expert panel of the study should interact with the semi-open questionnaire item. The questionnaire item is a seven-point Likert scale. To obtain data on this round, an invitation letter is sent to the study participants.

Data Analysis

Need Analysis Phase (Qualitative Data). The interview data for this phase was analyzed qualitatively. Data analysis was carried out after interviews were conducted with the participants. The first process carried out is the transcription of interviews. This process involves re-copying the data in the form of audio recordings of interviews with study participants. The entire content of the interview was recorded. Next, the data obtained is arranged according to the date of data collection. Data was analyzed using the Thematic Analysis method by Braun and Clarke (2014). This method is implemented by organizing, classifying, and coding the data thematically. For this analysis, the researcher analyzed the data by doing transcription first. The researcher took important sentences to support the quantitative data. In the context of this study, the researcher builds a theme by using literature review, the researcher's experience as well as through the answers given by the respondents. Then the data is transcribed according to the theme that has been built. Data can be divided by coding and categorizing data (Holland, 2007). Then the data is analyzed according to the themes that have been set.

Development Phase (Qualitative Data and Quantitative Data). The data for this phase were analyzed qualitatively and quantitatively in three rounds.

Qualitative Data (First Round). The interview data for this study was qualitatively analyzed. Data analysis is carried out after the interview was conducted with the study participants. The first process to run is the transcription of the interview. The process involves copying the data in the form of an audio recording of the interview with the study participants. The entire content of the interview is recorded. Next, the obtained data is organized according to the date of data recovery. Data analyzed using thematic analysis method by Braun and Clarke (2014). This method is implemented by organizing, sorting, and encoding data thematically. For this analysis, the researcher analyzes the data by doing the transcription first. The scholar takes the important sentences to support the quantitative data. In the context of this study, the researcher builds themes using the study of literature, the research experience as well as the answers given by the respondents. Then the data is transcribed according to the built theme. Data can be

divided by encoding and categorizing data (Holland, 2007). Then the data is analyzed according to the given theme. The main objective of this phase is to develop a model of research leadership based on expert approval views.

Table 3: *Example Theme Encoding Structure of a Participant for the First Round in Design Phase*

Dimension	Aspect	Item	Unit	Code
Professional leadership (PL)	Lead creatively (PLCR)	My research leader was a pioneer in solving a particular issue (PSPI)	P4:655-659	MKPIPGM-PL-PLCR-PSPI
Professional leadership (PL)	Lead change (PLCH)	My research leader created a positive culture within the team members by changing their attitudes (PCCA)	P3:166-173	MKPIPGM-PL-PLCH-PCCA

Table 3 shows the example of the theme encoding structure of a participant for the first round in the design phase. The theme encoding structure comprises dimensions, aspects, items, units, and codes. The reduction process through data encoding has resulted in a number of dimensions, subdimensions and items. The transcribed data is re-evaluated to confirm its consistency with the acquired list of dimensions, subdimension, and items, hence ensuring accurate categorization of the data. The encoding procedure is performed continually until a transcription of an interview is completed for a participant.

Qualitative Data (Second Round). The assessment of an instrument requires the involvement of a panel of experts using the expert review approach. The seven (7) same experts who participated in the first round is involved in the second round of the development phase. During the second round, every expert is given a questionnaire and asked to evaluate the items that were reviewed by the researchers using the interviewed data that was provided in the first round. Delphi panelists might have to evaluate or "order items based on their importance" in order to set early priorities among them. Round two results in the finding of areas of disagreement and agreement (Hsu and Sandford, 2007). According to (Vernon, 2009), consensus may not indicate agreement by all because it usually falls within the range of 55% to 100%, with 70% being the commonly accepted baseline. Thus, the second-round questionnaire provide experts with the chance to see how the other expert in the group ranked the items and choose if the expert wants to revise their own opinions based on the group agreement.

Table 4: *Example Expert Review of a Participant for Second Round in Design Phase*

Dimension	Sub-dimension	Item	Revised Item
Professional Leadership	Leading power-sharing	My leaders tend to make decisions with members of the organization	My research leader shares power in a controlled way to make it easier for team members to make decisions
Professional Leadership	Self-leading with high-level thinking skills	My leader dares to take risks in thinking of something solution	My research leader dares to come up with a new idea even if it's risky in terms of public acceptance.

Qualitative Data (Third Round). Then, the Fuzzy Delphi Method (FDM) is used to obtain a consensus panel of experts who act as participants in the study in this phase. There are two methods of processing the data in the Fuzzy Delphi method: (i) determining the agreement among experts on the item (triangular fuzzy numbers) and (ii) defining the position of the agreed item among experts (defuzzification process). In this round, Delphi's fuzzy analysis is used to assess the consensus among experts on the item (triangular Fuzzy numbers) and its placement. The defuzzification process. According to the fuzzy scores and threshold values, all of the listed items get a high rating and all expert panels have reached consensus.

FINDINGS

Malaysian Research Leadership Model has been established by gathering information on the attributes of successful primary schools and the methods to execute the essential elements. The data was obtained via input provided by participants during a data collection session that encompassed two phases: the Need Analysis Phase and the Development Phase, which included three rounds of Delphi.

Need Analysis Phase. The interview was carried out with a sample size of six participants, and the output of the interview was analyzed using thematic analysis. The findings of the study, which are the interview transcripts for the Needs Analysis Phase are as follows

The guidelines for doing research that produces high-quality research or outputs. The study participants share the perspective that research plays a crucial role in addressing and resolving issues.

If you ask me, when are we going to do the investigation? When there's a problem, we're gonna solve it, and if it doesn't matter, we don't have to investigate it, because it's perfect, so the main purpose of the investigation is to solve the problem. So I think I'm going to be the head of that investigation, first of all, the investigation we're doing, let's have an impact.

[PB3:129-133]

The guidelines for developing individuals to become effective research leaders. *The study participants said that the research guidelines for leadership were designed to cultivate effective individual leaders in the following way:*

If this model were presented to the leaders, it is anticipated that it would be effectively communicated, enabling them to systematically adhere to its contents and so emphasize the research leadership.

[PB4:196-199]

Structured guidelines gathered from the insights of experienced researchers. Study participants proposed the need of guidelines including input from experienced researchers in the prior studies disciplines.

The key component of the research is that the leader should actively conduct the research. The experience represents a research journey where we evaluate on our role as leaders, such as when I led my team of researchers.

[PB4:175-178]

Standard guidelines. Next, the study participants also stated the need for a single standard guideline. Study participants argued that the standard guidelines were intended to help leaders and prospective leaders fund research at the campus of the Institute of Teacher Education as follows.

This model of research leadership seems to have not existed. There may be, but it's not very visible. So maybe when there's one of these research models, we as leaders or future leaders can use this model to scratch the campus or facilitate research.

[PBL2:356-359]

In summary, the research conducted during the Need Analysis Phase aims to provide policy makers, policy implementers, leaders, and researchers with an entirely new viewpoint on developing a research leadership model within a local context.

Development Phase. This section discusses the findings of the three-part research, which consisted of a first round of interviews, a second round of expert validation, and a third round of Delphi's fuzzy findings.

First round. In the first round, the Delphi study data underwent analysis utilizing qualitative data analysis techniques. Subsequently, the data 559 items from the interview.

Second round. The second round of the Delphi study, five dimensions has been categorized. 31 subdimensions were identified under the dimensions. The instrument is evaluated by the same seven (7) professional reviewers who assess its overall dimension, subdimensions, and individual items. The second round of the Delphi research session resulted in a 492-item questionnaire.

Third Round. Out of the 492 questions that were examined, only 489 items were able to get a substantial degree of consensus among the majority of participants in the research. Presented below are the findings that encompass five (5) dimensions and 31 sub-dimensions, and 489 items of the Malaysian Research Leadership Model. The dimension of the model (i) professional leadership, (ii) leading research activity, (iii) fostering a collaborative and community culture, (iv) leading support, and (v) creating a conducive environment were accepted based on the consensus of an expert panel, with a threshold rate of d=<0.2 and a consensus percentage of >75%.

Table 5: *Expert Consensus Based on Triangular Fuzzy Number of the Dimensions based on Fuzzy Delphi analysis*

No.	Dimension	*Triangular Fuzzy Numbers*		Expert Consensus
		***Threshold Value*, d**	**Percentage of Experts' Consensus**	
1	Professional Leadership	0.189	80%	Accept
2	Leading Research Activity	0.195	81%	Accept
3	Fostering a Collaborative and Community Culture	0.155	87%	Accept
4	Leading Support	0.152	84%	Accept
5	Creating A Conducive Environment	0.119	90%	Accept

Threshold value, d ≤ 0.2
Percentage of expert group agreement ≥ 75%

Table 5 displays the level of consensus among experts in accepting or rejecting each identified element under the conditions of Triangular Fuzzy Numbers. Professional Leadership has a threshold (d) value of 0.189 and a deal percentage of 80%. This dimension has been totally approved and accepted by the consensus of experts. The threshold value (d) for the leading research activity dimension is 0.195, and the expert consensus is 81%. In addition, in order to promote a collaborative and a community culture, the threshold value (d) has been identified at 0.155, with an expert consensus percentage of 87%. The threshold value (d) for the leading support dimension is 0.152, represented as a percentage of 84%. The subsequent dimension is creating a conducive environment with the threshold value (d) of 0.119, and percentage of 90% consensus among experts. Total threshold value (d) for all the dimensions has been achieved by all components according to the criteria specified by Fuzzy Delphi that is ≤ 0.2. The percentage of expert consensus for all items also surpasses 75%.

Following, Table 6 displays five dimensions: (i) professional leadership, (ii) leading research activity, (iii) fostering a collaborative and community culture, (iv) leading support, and (v) creating a conducive environment. Each dimension consists of subdimensions, as shown.

Table 6: *Dimensions and Subdimensions of Malaysia Research Leadership Model*

DIMENSIONS	SUBDIMENSIONS	
Professional Leadership	(a) Overrides clear research direction (b) Self-leading with high-level thinking skills (c) Lead creatively (d) Lead Change	(e) Lead decision making based on research findings (f) Leading power-sharing (g) Leading communication skills
Leading Research Activity	**Pre-Research Activity** (a) Need Analysis: SWOT (b) Proactive attitude to identify sources (c) Knowledge Analysis **During Research Activity** (d) Leading the application of knowledge	**Post-Research Activity** (f) Override the creation of new products (g) Leading a change in self-attitude (h) Leading self-reflection (i) Leading supervision of post-investigation activities

	(e) Leading research organization	
Fostering a Collaborative and Collective Culture	(a) Leading expertise sharing (b) Leading decision-making collectively (c) Adhering to a trusting attitude	
Leading Support	**Internal IPG Support:** (a) Resource usage (b) Leading collaborative expertise (c) Leading organizational recognition	**External IPG Support:** (d) Leading the provision of opportunities (e) Conducting consultations and consultations of experts outside the organization
Creating a Conducive Environment	(a) Leading harmonious relationships (b) Leading the implementation of the rules (c) Leading the use of facilities	

DISCUSSION

The discussion of the findings of the study in this Development Phase is a reference to the Research Leadership Model of the Higher Education Institutions. Effective research leadership is essential for achieving success in educational institutions. They have a crucial function in creating a stimulating and cooperative atmosphere. Effective research leadership not only assists its professors in securing research funding. They assist their professors in navigating the shortcomings, obstacles, and complexity associated with doing research, in order to alleviate burdens and enable researchers to concentrate more effectively on their study and enhance their research proficiency (Smith, 2019). An effective research leader must possess strong communication skills to comprehend the difficulties and requirements faced by teacher-researchers. Thus, effective research leadership entails clear communication to comprehend the challenges and requirements of teacher-researchers, fostering collaboration among teachers, reducing or managing administrative responsibilities to allocate more time and attention for teachers to concentrate on their research, and recognizing the significance of their role in both the researchers' achievements and the institution's success (G. Yaw & S. Serrano, 2022). They should also foster collaboration among teachers, alleviate or handle administrative responsibilities to create more time and focus for teachers to dedicate to their research. Additionally, they must recognize the significance of their role in both the researchers' achievements and the institution's overall success.

The development of this model is based on the agreement of views among the experts of the Delphi study high on the contents of the model developed. This is because according to Bush (2008) states that there is still a lack of consensus among leadership experts about the definition of closely associated leadership. The consensus is obtained through the Fuzzy Delphi analysis on the data obtained through interview and expert review. In addition, the content of the Research Leadership Model of the Institute for Teacher Education of Malaysia contains five dimensions obtained from the study highlights and findings of the study at the First Round Development Phase. The five dimensions contained in this phase are (i) professional leadership, (ii) leading research activity, (iii) fostering a collaborative and community culture, (iv) leading support, and (v) creating a conducive environment. All these dimensions have their respective subdimensions.

The implication of the study was to create and establish a research leadership model designed especially for higher education institutions. From different perspectives, research leadership is seen vital in today's world for the

development of educational institutions. Several worldwide studies (e.g., Evans, 2012a, 2014b; Flinders and Anderson, 2019) indicate that a research-leadership model is necessary in higher education and is considered as an effective style of leadership. Leaders has the ability to effectively enhance their own expertise and guide research activities within the organization.

In conclusion, this study was expected to guide the lecturers at higher education institutions in Malaysia who led research activities within groups. Additionally, it intended to identify the characteristics of effective research leaders and provide recommendations for lecturers to reference when conducting research activities. The findings of the study are to provide stakeholders, particularly individuals associated with higher education institutions, with valuable knowledge regarding the importance of significant individuals within organizations, students, and communities in order to enhance research activities.

CONCLUSION

This study was to study the practices of lecturers at higher education institutions in Malaysia who led research activities within groups. Additionally, it intended to identify the characteristics of effective research leaders and provide recommendations for lecturers to reference when conducting research activities. The objective of this study is to provide stakeholders, particularly individuals associated with higher education institutions, with valuable knowledge regarding the importance of significant individuals within organizations, students, and communities in order to enhance research activities.

Acknowledgements
This article is part of a research sponsored by the Prime Minister's Office (ID: GA027-2022).

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