

A Proposed Methodology on Developing an Awareness Model of Competitiveness and Quality Standards for Smallholders in The Oil Palm Industry

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ABSTRACT

The production of FFB according to quality requirements is necessary for smallholders of oil palm to pay attention in the oil palm industry. Any discrepancy in the supply chain would affect their productivity. Therefore, the owners must follow the right practices to remain efficient and ethical in the production field. This study establishes a model and enables smallholders to build knowledge of competition and commitment to standards. This research explains the implementation technique utilising the DDR (Design, Development and Research) approach, which involves three main phases: the requirement analysis, design and development, and finally the usability evaluation of the proposed model. The functionality analysis process identifies the need to create a concept based on a survey on the topic of the project, and the design and development process focuses on the components and elements involved in the design using Fuzzy Delphi Method (FDM) approach. The usability phase utilises Modified Nominal Group Technique (NGT). The research offers market perspectives into the field of organisational characteristics, including the divisions and styles of operations involved in the sale and production of FFB, the state-of-the-art processes and the elements involved in the implementation of the model. The research will add to the information base in the area concerned and act as a potential guide to other academics.

Keywords: Fresh Fruit Bunches (FFB); Competitiveness; Design Development and Research (DDR); Fuzzy Delphi Method (FDM); Modified Nominal Group Technique (NGT)

INTRODUCTION

Smallholders do not follow the FFB quality requirements and are not competitive on the market (Bronkhorst et al . 2017; A. R. Che Omar et al. 2018; C. M. Z. Che Omar & Saripuddin 2015). It can be achieved by adhering to the laws on the set of quality standards practices defined by the authority and fruit dealers, namely the Good Agricultural Practice (GAP) and the Code of Practices (COPs) for dealers (A. R. Che Omar et al . 2018; Jamian et al. 2014). While several types of research have been performed on the compliance of smallholder standards, no particular attention has been paid to both competition and ethical (IBE) implementation in everyday operations. The establishment of RSPO internationally and of MSPO as a local variant in the industry is appropriate for the market players in the output and selling of FFB in the supply chain. Sustainability policies still serve as a framework for the development of

regulated FFBs, and there is no need to create another approach to push smallholders into the scheme. There is, therefore, a need to improve and raise awareness of the strategies already developed to remain successful in the production and marketing sectors of the supply chain of FFB. It is to prevent an unwanted impact on their livelihoods in the industry. This research employs a DDR approach in developing a design and developing a model. The model is based on the requirement analysis from respondents in the oil palm industry. The process of identification of verification of the selected components and elements are conducted by utilising an FDM and NGT approaches, respectively.

THE PROPOSED METHODOLOGY

Design and Development Research (DDR) is an approach to the research design, which makes up as road maps for researchers (Davies & Codenza 1988) pp 116. It is a comprehensive study in developing a product empirically (Mohd Ridhuan & Nurulrabiah 2020; R. C. Richey Klien & Nelson 2004; R. Richey & Klien 2007). Fuzzy Delphi Process (FDM) and the Modified Nominal Group Techniques (NGT) are utilised in this approach accordingly. It includes interviews with market experts in the industry.

What are the characteristics of an expert?

These are some criteria of an individual as an expert in an industry. Mohd. Ridhuan and Nurulrabiah (2020) in a book - *Kepelbagaian Metodologi dalam Penyelidikan Rekabentuk dan Pembangunan* (2020) pg 85-86 have these to acknowledge:

- i. An individual who has been working in a specific field for more than five years (Berliner 2004).
- ii. An individual who is well-respected in the industry and cited in paper presentation and publication of educational content, the person is considered an expert (Tajul Ariffin 1997).
- iii. An individual who has extensive knowledge and skill in a specific area in an industry (Swanson & Holton 2009).
- iv. An expert must be willing and responsive to research-related issues and has a lot of information that can be shared and can render commitment and appreciate the views of others (Delbecq Van de Ven & Gustafson 1975).
- v. Academically competent and rational in any research work, possesses good track record, and freely willing to contribute to researchers in a related field (Gambatese & Gagnon 2008).
- vi. Experts should have the same background, competent to provide relevant expertise and be able to improve results in a specific field accordingly (Oh 1974; Pill 1971).

Research Design and Research Methodology Framework

The stages involved in DDR approach by Richey & Klien, 2007 is expressed in Table 1.0, which shows the phases involved. It is a general research design to be adopted. While Figure 1.0 indicates a more comprehensive approach to the analysis flow. The research methodology framework (Figure 1.0) outlines the flow of the research level. It starts with the use of the DDR approach, which then moves down to the three-phase model involved. Shyielathy Arumugam, Kway and Zainah (2019) develop a symptomatic behaviour screening tool (symbest) for children aged 3-4 years old with behaviour problems using DDR, to mention a few (Arumugam Eng Hock & Mohamed Isa 2019). It is part of the pathway into the full step of a model creation using DDR coupling up with more approaches accordingly. The model generated as set out in

phase two is a prototype that must be tested by experts in the field concerned. In this case, it is from the oil palm industry.

Table 1.0: The three phases in DDR

| Phase | Method |
|---------------------------------|--|
| Phase I: Requirement Analysis | Survey |
| Phase II: Design & Development | Literature Review, <i>Fuzzy Delphi Method (FDM)</i> |
| Phase III: Usability Evaluation | Modified Nominal Group Technique (<i>Modified NGT</i>) |

Adapted from: Mohd. Ridhuan (2016), Rejab (2019)

Further to this stage, there will be a related discussion about each process concerned in this article.

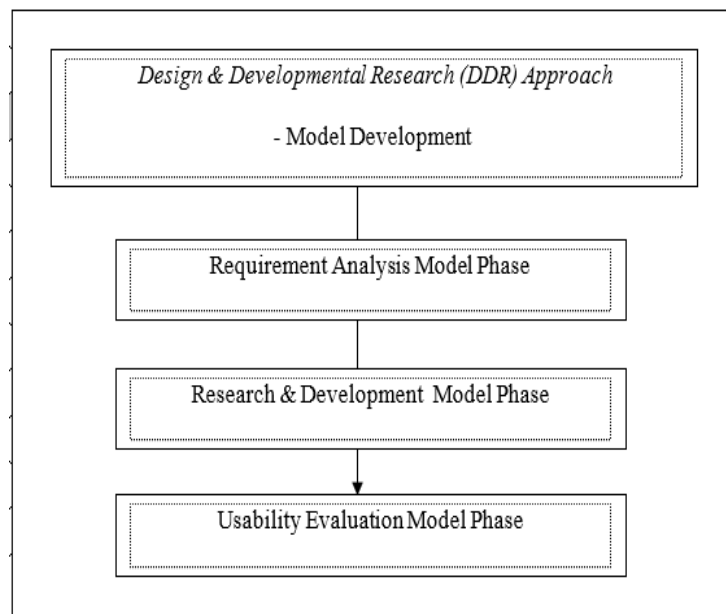


Figure 1.0: Research Methodology Framework; Adapted from Mohd. Ridhuan (2016) and Mohd Ridhuan & Nurullrabiah. (2020)

Phase I - Requirement Analysis

Phase One (I) is referred to as the Requirement Analysis. It is for the development of a model, guideline or framework and employs the smallholder survey approach as a unit of analysis. It is to measure the participants' perceptions and views on the inclusion of the elements of competitiveness and IBE in the model. This process justifies the need for a model to be created. The survey on smallholders of oil palms starts to define their expertise, experience and understanding of the existence of quality requirements in the industry. It is also to test their knowledge of the principle of competition that FFB output in the industry should take into account in their everyday livelihoods.

Phase II - Design and Development

Phase Two (II) is the Design and Development Phase. The design and development phase is the most critical phase in the study using the design and development approach of a product or model (Rejab 2020; Ven den Akker J., Gravemeijer K. 2006). It involves the process of reviewing the literature on previous studies to identify the main components and elements contained in the intended model to be developed. Further, the main features and related details are to be evaluated and validated by a group of experts in the industry based on the Fuzzy Delphi (FDM) approach through a face-to-face workshop (Mohd Ridhuan & Nurulrabiah 2020).

Fuzzy Delphi Method (FDM)

Many researchers apply FDM to verify the components and elements obtained from the literature review in the design and development stage. It is in phase two of the process. FDM is an approach used widely in the verification of the components and elements in the research methodology. It is also referred to as *constructs for components* and *items for elements*, respectively (Arumugam et al. 2019) This method employs expert validation to assess, reject and adding component and element in the new proposed model using Delphi Method (Hsu Lai & Lin 2014; Jamian et al. 2014). Mazidah Rejab (2018), employs FDM Experts to validate the components or constructs and items in the proposed model. Mazidah's article is about developing a model on "Improving Traceability Model with Test Effort Estimation" (Rejab 2020). At the same time, other articles written based on FDM actively employ this technique in the research industry. Manakandan (2017), demonstrates that the Fuzzy Delphi method is one of the scientific analysis technique to consolidate consensus agreement within a panel of experts (Manakandan et al. 2017). It indicates that FDM is an approach that promotes the process of consensus-building by experts as it is very versatile in the field of analysis (Mohd Ridhuan & Nurulrabiah 2020).

Literature review contributes to the generation of components and elements of the phase of the process towards designing a prototype model. Figure 3.0 shows the flow of the process from the stage in literature search, to the formation of the prototype model. This verification process employs the FDM approach. In this case, the components are identified as *competitiveness* and *ethics* or specifically identified Islamic business ethics (IBE). Many items are described under each component accordingly. *Competitiveness* is the ability of an organisation to deliver values of product and services at a reasonable cost (Hales & Mclarney 2017; Porter 1980) whilst Islamic business ethics (IBE) is the ethical practices in the business world in exerting the Islamic teaching (Al-Qaradhawi 2009; Almoharby 2011). The final stage is the evaluation of the prototype model using Modified Nominal Group Technique (NGT). It comes under phase three of the process by which a model is expected to be fully developed successfully.

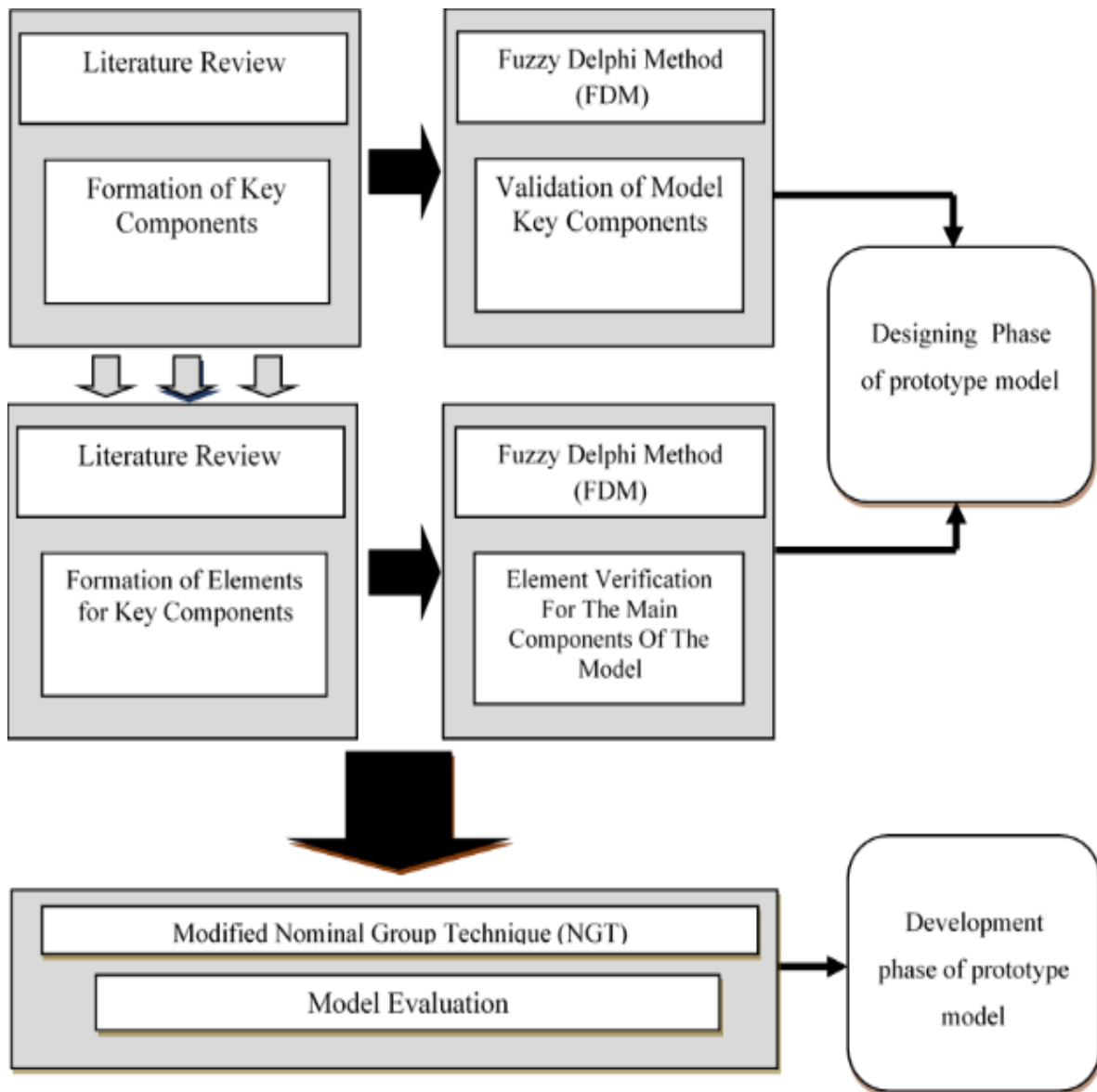


Figure 3.0: Method-based Design and Development Model
 Adapted from: Mohd Ridhuan (2016) and Arumugam et al (2019)

Steps in Using FDM

Mohd. Ridhuan and Nurulrabihah, (2020) further explain in their book the steps to be taken in utilising FDM in research. It is to explain the recognition as empirical research.

Table 2.0: Steps in Utilising Fuzzy Delphi Method (FDM) Approach

| Step | Explanation |
|--------|--|
| Step 1 | Fabricate questionnaire based on these points: Literature review, interview with experts, focus group, questionnaire (based on the points fabricated in phase 1 and to be used in phase III. Phase is derived separately). |
| Step 2 | Orchestrate a method of discussion. It can be in the form of seminar, online meeting, face-to-face meeting, or by email. |
| Step 3 | Convert all linguistic variables into <i>fuzzy triangular numbers</i> (e.g., Linguistic variable: Strongly Disagree into Fuzzy scale (0.0, 0.0, 0.2)) |
| Step 4 | Convert Likert scale to fuzzy scale. Conduct analysis using a template as developed by Mohd. Ridhuan and Nurulrahimah in their book). It is to obtain a threshold value, d (see figure 4.0). |
| Step 5 | Decide on the reading of threshold value, d. If the value is less or equal to 0.2 (d=0.2), it means that all the experts have come to a consensus on an item in question (Cheng & Lin 2002). |
| Step 6 | If a percentage value exceeds 75%, it shows that the experts have reached a consensus on the decision to accept the items accordingly (Chu & Hwang 2008). |
| Step 7 | Determine the ranking of the items by determining the fuzzy evaluation process using this formula: $A_{max} = 1/3 * (m_1 + m_2 + m_3)$. |

Source: Mohd. Ridhuan and Nurulbariah (2020)

Data Interpretation in FDM

Mohd Ridhuan and Nurulrabiah (2020) clarify that FDM is a re-branding of the traditional Delphi Method. It is to ensure that research results are produced empirically and effectively matched accordingly to the research goal that involves uncertainty (Murray Pipino & Vangigch 1985). Mohd Ridhuan and Nurulrabiah (2020) continues to stress that it is a unique combination of the numbering of the fuzzy set and Delphi method itself and it is brought into practice by a mathematician called Lotfi Zadeh. It illustrates the ambiguous essence of the result from the binary method that uses YES and NO as well as the ambiguous 1 and 0 numbers of our daily lives (Ragin 2007). In the professional gathering for the decision-making process, the fuzziness or uncertainty is finally smoothed out (Chang Huang & Lin 2000). Mohd Ridhuan and Nurulrabiah (2020) concludes that the FDM approach is acceptable with the use of the consensus gathered from the experts serving as respondents as a legitimate outcome. Consequently, a quantitative process will be used to interpret the views of experts empirically (Gossler et al. 2019; Hill & Fowles 1975).

There are two main strategies used. One is the *Triangular Fuzzy Number*, and the other one is *Defuzzification* in the *Fuzzy Evaluation process*. The Triangular Fuzzy Number is made up of m_1 , m_2 , and m_3 numbers where m_1 is the *smallest value*; the *most plausible value* is denoted by m_2 . Consecutively, m_3 is the *maximum value*. All three values are shown (in Figure 3.). It shows the minimum value versus triangular values. They reflect a reading range of 0 to 1 Fuzzy scale (Ragin 2007) as opposed to the usage of the Likert scale. Likert scale with a range of 1 to 5 or 7 is further synthesised in a fuzzy scale. It is not only in one value; but three - m_1, m_2 , and m_3 . It tells the difference between Fuzzy and Likert scale. The Likert scale only tells the researcher's ranking as opposed to Fuzzy numbers; it is the experts' contribution to the ranking of the elements in the making (Mohd Ridhuan & Nurulrabiah 2020).

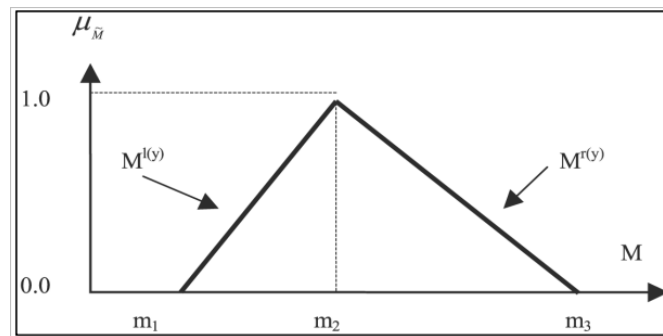


Figure 3.0: Minimum value Vs Triangular value graph (Adapted from Moh. Ridhuan and Nurulrabihah (2020))

The *Fuzzy evaluation process* is the ranking process of the constructs, items, and other related factors in the study. It is also referred to as *Fuzzy numbers*. This ranking mechanism enables the gathering of statistics based on a consensus of experts who are themselves the research personnel respondents or in research; it is known the *unit of analysis*. The *fuzzy number* or *fuzzy score* sign goes like this: **Amax**.

There are three formulas to choose from when setting the score. As follows, they are:

- i. **Amax = 1/3 *(m1 +m2+m3)**
- ii. **Amax = 1/3 * (m1 +2m2+m3)**
- iii. **Amax = 1/3 * (m1 +4m2+m3)**

In a simulation in their book (pg 101-103), Tables 3.1; 3.2 & 3.3, Mohd Ridhuan and Nurulbasihah (2020), show the variance of outcomes in fuzzy numbers resulting from the different number distributions in the Likert scale. It shows that the formulas are similar. Each one gives a similar fuzzy score (Amax) by indicating a value of 1 in each value of m_1 , m_2 , and m_3 , respectively.

The interpretation of data in this phase undergoes three conditions. The first two conditions are about the utilisation of Fuzzy numbers in a process to assess the consensus of experts in the choice of a construct or item accordingly. It is a matter of concern or recognition by the experts. The third condition, though, is an extension of that; whether to accept or oppose it. It is through the comparison of the fuzzy score with α -cut (alpha- cut) value.

These are the explanation of the conditions required in the data interpretation in FDM. The first condition is by using a *threshold value*, d . A formula is used in this strategy, and it is shown in Figure 4.0. Any value exceeding or lesser than 0.2, the item in question is *Accepted*, whilst a value exceeding this value (0.2) it is deemed to be *Rejected* or to be recirculated to disputing parties only for reconsideration (Chen 2000; Cheng & Lin 2002). The second condition is based on the traditional Delphi Method.

$$d(\tilde{m}, \tilde{n}) = \sqrt{\frac{1}{3} [(m_1 - n_1)^2 + (m_2 - n_2)^2 + (m_3 - n_3)^2]}.$$

Figure 4.0: A Formula to calculate a threshold value

Any consensus figure exceeding 75% of the items are deemed acceptable or rejected unanimously (Chu & Hwang 2008). The third condition is the α -cut (alpha-cut) value. It is a median between the fuzzy number (0-1) that is 0.5. If the fuzzy score exceeds 0.5, it means that the items are acceptable. Likewise, if it is lower than the value of 0.5, the item is deemed to be rejected (Tang & Wu 2010).

The number of experts required in FDM approach.

The number of experts varies according to various scholars. The range of scholars varies according to the nature of researches. Mohd. Ridhuan (2020), believes that there is no significant difference in the number of experts chosen. If it too big a number, the research could be done through questionnaire basis or email. Too big some posts as a deterrent in obtaining consensus decision. Dominant participants aggravate the situation more, add Mohd. Ridhuan (2020). Other scholars views are as follows: Adler and Ziglo (1996) – between 10 to 15; Jones and Twist (1978) – 10 to 50; Burn (1998) – 15; Alexander and Koroposki (1998) – more than 60; Compos et al. (2018) – 10 to 15 (Adler & Ziglio 1996; Burns 1998).

Hence, this section explained the design and development phase in the intended study. It involves the industry experts in determining the validity of the components and related element of the issue as obtained in the requirement analysis phase.

Usability Evaluation (Phase III)

Nominal Group Technique approach

Phase Three (III) is the Usability Evaluation stage of the intended model. Usability is defined as a measure of the ability of the developer to utilise the product itself (Arumugam et al. 2019; Mack & Sharples 2009). Modified Nominal Group Technique (NGT) is used to test and evaluate the usability of the model that has been developed (Arumugam et al. 2019; Varga-Atkins & McIsaac 2011). It is a technique used in a face-to-face small group-based collection of data through a structured meeting (A.Aziz & Siraj 2015; Varga-Atkins & McIsaac 2011). Besides, NGT is a dynamic approach that fits diverse areas of design and development work, which does not only describe perception but also quantitatively (Mohd Ridhuan & Nurulrabiah 2020).

Researchers are too mindful of the impact of the product developed on consumers, but neglect the analysis of the use of components and elements in the product itself (R. Richey & Klien 2007). The missing point is the integrity and rigour of the elements involved. Initially, NGT is a semi-quantitative approach to organised data collection technique involving a population that is dependent on the expertise of the respondents. However, in due course, additional research by researchers are known to be fully quantitative when used to determine the usefulness of the product. It is referred to as the modified NGT (Arumugam et al., 2019; O'Neil and Jackson, 1983). In short, there are two research-focused concepts. Initially, recognition of an issue or issue, and then approval or vote in a collective process. The choice of experts is similar to the one in FDM.

CONTRIBUTION TO RESEARCH

It is a multiple research methodology. It includes qualitative nature in the beginning and ends quantitatively. It is a multi-method technique that translates qualitative knowledge into quantitative evidence. It is made possible by using FDM in the design and development of a prototype model and testing its functionality with Modified NGT. This mixture of the three stages of the DDR strategy adds to the study methods of other academics in the making. Empirically, the results of the techniques used by FDM and NGT can be replicated.

Components and elements are different from those of prior research. It may act as an extension of the method in the study. Practically, it allows society to build a knowledge paradigm that incorporates various constructs that are also closed to society, academia and public or private organisations.

CONCLUSION

The suggested research technique serves as a tool for creating a model for oil palm smallholders to be aware of the practices in the Malaysian oil palm industry. It is about the comprehension of the open market's competition. In GAP and SOPs, the standard protocols are there to accomplish one. The key sources to be used are FDM and NGT.

ACKNOWLEDGEMENT

The authors would like to thank the members of the Faculty of Management and Muamalah (FPM) and the Post Graduate Studies Center (PPS) of Kolej Universiti Islam Antarabangsa Selangor (KUIS) for their assistance and motivation.

References

- A.Aziz, S. F. & Siraj, S. 2015. Pembangunan model objektif kurikulum berasaskan taman buah-buahan dan sayur-sayuran berkhasiat untuk sekolah rendah Orang Asli. *Jurnal Kurikulum & Pengajaran Asia Pasifik*, 3(3), 20–31.
- Adler, M. & Ziglio, E. 1996. *Gazing into the oricle: The Delphi ,ethod and its application to social policy and public health*. London: Jessica Kingsly Publishers.
- Aikanathan, S., Chenayah, S. & Sasekumar, A. 2011. SUSTAINABLE AGRICULTURE : A CASE STUDY ON THE PALM OIL INDUSTRY 30(1), 66–75.
- Al-Qaradhawi, Y. 2009. *Ekonomi Islam: Nilai dan Akhlak*. (M. S. A. Ishak, Ed.) pp. First Edit. Kuala Lumpur: Yayasan Pembangunan EkonomiIslam (YaPEIM).
- Almoharby, D. 2011. The current world business meltdown: Islamic religion as a regulator. *Humanomics*, 27(2), 97–108.
- Arumugam, S., Eng Hock, K. & Mohamed Isa, Z. 2019. Methodology of Developing Symptomatic Behavior Screening Tool (Symbest) for Children Aged 3-4 Years Old With Behavior Problems. *Muallim Journal of Social Science and Humanities*, 3(3), 324–341.
- Berliner, D. C. 2004. Describing the behaviour and documenting the accomplishment of expert teachers. *Bulletin os Science and Technology & Society*, 24(3), 200–212.
- Bronkhorst, E., Cavallo, E., Medler, van D. tot, Klinghamme, S., Smit, H. ., Gijzenbergh, A. & van der Laan, C. 2017. Current practices and innovations in smallholder palm oil finance in Indonesia and Malaysia: Long-term financing solutions to promote sustainable supply chains. *Center for International Forestry Research (CIFOR)*,.
- Burns, F. . 1998. Essentila components of schizhrophrenia care: a Delphi approach,. *Acta Psychiatri Scand*, (112(3)), 400–4005.
- Chang, P. T., Huang, L. C. & Lin, H. J. 2000. The Fuzzy Delphi Method via fuzzy statistics and membership function fitting and an application to the human resources. *Fuzzy sets and system*, (112(3)), 511–520.
- Chen, C. . 2000. Extensions of TOPSIS for group decision-making under fuzzy environment. *Fuzzy sets and system*, 114–119.
- Cheng, C. H. & Lin, Y. 2002. Evaluating the best main battle tank using fuzzy decision theory with linguistic criteria evaluation. *Eoropean Journal of Operational Research*, 142(1), 74–86.
- Chu, H. . & Hwang, G. . 2008. A Delphi-based approach to developing expert systems with the cooperation of multiple experts. *Expert systems with applications*, 34, 26–40.

- Davies, D. & Codenza, R. M. 1988. *Business Research for Decision Making* pp. 4th Edisi . Belmont, California: Duxbury Press - An Imprint of Wadsworth Publishing Company.
- Delbecq, A. ., Van de Ven, A. H. & Gustafson, D. H. 1975. *Group Techniques for program planning*. Glenview. IL: Scott. Foresman, and Co.
- Gambatese, S. & Gagnon, R. J. 2008. Design's role in construction accident casualty and prevention: p[erspectives from aqn expert panel, *Safety Science* (46), 675–691.
- Gan, P. Y. & Li, Z. D. 2014. Econometric study on Malaysias palm oil position in the world market to 2035. *Renewable and Sustainable Energy Reviews*, 39, 740–747.
- Gossler, T., Falagara Sigala, I., Wakolbinger, T. & Buber, R. 2019. Applying the Delphi method to determine best practices for outsourcing logistics in disaster relief. *Journal of Humanitarian Logistics and Supply Chain Management*, 9(3), 438–474.
- Hafizuddin-Syah, B. A. . & Shaida, S. 2019. Sustainability Certifications and Financial Profitability : An Analysis on Palm Oil Companies in Malaysia. *Jurnal Pengurusan*, 54(2018), 143–154.
- Hales, G. & Mclarney, C. 2017. Uber's Competitive Advantage vis-à-vis Porter's Generic Strategies.: University of Liverpool Library. *IUP Journal of Management Research*, 16(4), 7–22.
- Harver, N. & Holmes, C. A. 2012. Nominal group technique: An effective method for obtaining group concenses. *International Journal of Nursing Practice*, 18, 188–19.
- Hill, K. Q. & Fowles, J. 1975. The methodological worth of the Delphi forecasting technique. *Technology and Forecasting and Social Change*, 7(2), 179–192.
- Hsu, M., Lai, Y. & Lin, F. 2014. The impact of industrial clusters on human resource and firms performance 9(2), 141–159.
- Ibragimov, A., Sidique, S. F. & Tey, Y. S. 2019. Productivity for sustainable growth in Malaysian oil palm production: A system dynamics modeling approach. *Journal of Cleaner Production*, 213, 1051–1062.
- Jamian, R., Ab Rahman, M. N., Md Derus, B., Mohamed, M. S. & Nik Ismail, N. Z. 2014. A Conceptual Approach of 5S to Improving Quality and Environmental Performance of Malaysian Oil Palm Dealers. *Jurnal Teknologi*, 1, 65–73.
- Mack, Z. & Sharples, S. 2009. The importance of usability in product choice: A mobile phone cases study. *Ergonomics*, 52(12), 1514–1528.
- Manakandan, S. K., Ismai, R., Jamil, M. R. M. & Rangunath, P. 2017. Pesticide applicators questionnaire content validation: A fuzzy delphi method. *Medical Journal of Malaysia*, 72(4), 228–235.
- Mohd Ridhuan, M. J. & Nurulrabiah, M. N. 2020. *Kepelbagaian Metodologi dalam penyelidikan reka bentuk dan pembangunan* pp. First. Shah Alam, Selangor, Malaysia: Qaisar Prestige Resources 2020.
- Mohd Zulkifli, Z., Hashim, F. H., Raj, T. & Huddin, A. B. 2018. A Rapid and Non-Destructive Technique in Determining The Ripeness of Oil Palm Fresh Fruit Bunch (FFB) 30(1), 93–101.
- Murray, T., Pipino, L. & Vangigch, J. 1985. A pilot study of Fuzzy set modification of Delphi. *Human System Management*, (5(1)), 6–80.
- Nambiappan, B., Ismail, A., Hashim, N., Ismail, N., Nazrma, D., Abdullah, N. I. K., Idris, N. I. K. et al. 2018. MALAYSIA : 100 YEARS OF RESILIENT PALM OIL ECONOMIC PERFORMANCE 30(March), 13–25.
- O'Neil & Jackson, L. 1983. Nominal Group Technique: A proess for initiating Curriculum Department in Higher ducation: *Studies in Higher Education*,.
- Oh, K. . 1974. *Forecasting through hierarchical Delphi*. Ohio State University.
- Pill, J. 1971. The Delphi Method: Substance, context, a critique and an annotated bibliography. *Socio-economic Planning*, (5), 57–71.

Porter, M. 1980. *Competitive Strategy - Technique for Analysing Industries and Competitors* pp. First. New York: Free Press- Simon and Shuster Inc.

Ragin, C. C. 2007. *Qualitative comparative analysis using Fuzzy sets (fsQCA) in configurational comparative analysis*. SAGE Publications.

Rejab, M. 2020. DDR : Requirement Analysis Phase Design & Development Phase Usability Analysis Phase.

Richey, R. C., Klien, J. D. & Nelson, W. . 2004. *Development Research: Studies of Instructional Design And Development*. pp. Vol. 4th. Mahwah, NJ: Lawrence Erlbaum Associates. Inc.

Richey, R. & Klien, J. 2007. *Design and development research: Methods, strategies and issues*. London: Erlbaum. Rohani, No Title. London: Erlbaum. Rohani,.

Swanson, R. A. & Holton, E. . 2009. *Foundations of human resource development*. (C. B.-K. Publishers, Ed.) pp. 2nd Edisi . San Francisco.

Tajul Ariffin, N. 1997. *Pendidikan satu pemikiran semula*. Kuala Lumpur.

Tang, C. W. & Wu, C. . 2010. Obtaining a picture of undergraduate education quality: A voice from inside the university. *Springer, Higher Education*, 269–286.

Varga-Atkins, T. & McIsaac, J. 2011. *The Nominal Group Technique: A practical Guide for facilitators - written for ELESIG Small Grants Scheme* pp. Vol. Version 1. Liverpool: University of Liverpool.

Ven den Akker J., Gravemeijer K., M. S. & N. N. 2006. *Educational Research Design*. New Jersey: Routledge 2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN.

Zahari, A. R. & Esa, E. 2018. Drivers and inhibitors adopting renewable energy: an empirical study in Malaysia. *International Journal of Energy Sector Management*, 12(4), 581–600.