Bukti Korespondensi Author

Tambahan Baru

A. PAPER 5:	**Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making. Penulis: Okfalisa Okfalisa, Rizka Hafsari, Gusman Nawanir, Saktioto Toto,Novi Yanti (5 orang), Pertanika Journal Science and Technology, Vol. 9, Issue 2, April 2021.**

Paper ini disubmit ke jurnal pertama kali pada 28 Oktober 2020, Mendapat hasil reviewer pada 24 Desember 2020, Mendapatkan full acceptance 19 Maret 2020, Full published pada April 2021.

Bukti Korespondensi dapat dilihat pada Gambar berikut dan lengkapnya dapat dilihat pada lampiran:

1. Submission ke jurnal JST Pertanika pada 28 Oktober 2020, dan dibalas oleh pihak jurnal pada 15 Desember 2020

Gmail okfalisa saktioto <okfalisa@gmail.com>

Re: Manuscript ID JST-2284-2020 - Status Query (Under Review)
1 message

JOURNAL OFFICER MALAR / UPM <journal.officer-2@upm.edu.my> Tue, Dec 15, 2020 at 6:34 AM
To: okfalisa saktioto <okfalisa@gmail.com>
Cc: PERTANIKA EXECUTIVE EDITOR / UPM <executive_editor.pertanika@upm.edu.my>

Dear Author(s),

I refer to your query seeking status for your submitted article entitled "**Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making**" (*Manuscript ID. JST-2284-2020*) for intended publication in Pertanika JST.

I would like to inform you that your manuscript is **under peer-review process** and you shall be contacted by my office once the peer review for your submitted article is **over**, or a decision has been made by the Journal's Editorial Board on the suitability of your article for publication in Pertanika.

NOTE: It normally takes **8-12 weeks** for an article to undergo its peer-review process.

--
(Mrs. Kanagamalar on behalf of Chief Executive Editor)
Please cc your email to executive_editor.pertanika@upm.edu.my

---

Prof. Dato' Dr. Abu Bakar Salleh
Chief Executive Editor (UPM Journals)
PERTANIKA EDITORIAL OFFICE
Bangunan Putra Science Park
1st Floor, Tower II, UPM-MTDC Technology Centre
Universiti Putra Malaysia
43400 Serdang, Selangor, Malaysia

Email 1: journal.officer-2@upm.edu.my (Pertanika JST)
Tel: + 603 9769 1620
Email 2: executive_editor.pertanika@upm.my (Chief Executive Editor)

On Mon, Dec 14, 2020 at 6:47 PM okfalisa saktioto <okfalisa@gmail.com> wrote:
> Dear journal editor,
>
> Please, let me know the review progress of our paper ID JST-2284-2020.R1.
> Title: "Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making".
> Submission on 28 October 2020.
>
> Many thanks and best regards
>
> Okfalisa

https://mail.google.com/mail/u/0?ik=0d9b2dffcc&view=pt&search=all&permthid=thread-f%3A1686088585054225987&simpl=msg-f%3A1686088... 1/1

2. Memperoleh revisi 1 dari reviewer, 24 Desember 2020

Gmail okfalisa saktioto <okfalisa@gmail.com>

Journal of Science and Technology - Decision on Manuscript ID JST-2284-2020.R1 (AA)

2 messages

Journal of Science and Technology <onbehalfof@manuscriptcentral.com> Thu, Dec 24, 2020 at 7:00 AM
Reply-To: executive_editor.pertanika@upm.edu.my
To: okfalisa@gmail.com, okfalisa@uin-suska.ac.id
Cc: okfalisa@gmail.com, okfalisa@uin-suska.ac.id, rizkahafsari@gmail.com, abdulhasanuin@gmail.com, gusman@ump.edu.my, zahidahz@iium.edu.my, saktioto@yahoo.com, novi_yanti@uin-suska.ac.id

24-Dec-2020

Dear Assoc. Prof. Okfalisa,

Manuscript ID JST-2284-2020.R1 entitled "Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making" which you submitted to the Journal of Science and Technology, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter. I invite you to respond to the reviewer(s)' comments and revise your manuscript.

To revise your manuscript, log into https://mc.manuscriptcentral.com/upm-jst and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.

You may also click the below link to start the revision process (or continue the process if you have already started your revision) for your manuscript. If you use the below link you will not be required to login to ScholarOne Manuscripts.

*** PLEASE NOTE: This is a two-step process. After clicking on the link, you will be directed to a webpage to confirm. ***

https://mc.manuscriptcentral.com/upm-jst?URL_MASK=119e6154fe6b41e1876851f7f4e524f7

You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using colored text.

Once the revised manuscript is prepared, you can upload it and submit it through your Author Center using the SAME Manuscript ID. JST-2284-2020.R1. Please DO NOT create a new Manuscript ID.

When submitting your revised manuscript, you will be able to respond to the comments made by EACH reviewer (POINT-BY-POINT) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).

Reviewer(s)' Comments to Author:

Reviewer: 1

Comments to the Corresponding Author
I found the paper interesting, yet there's few aspects that need to be improved:
1. The citations need to be more recent. Even though DSS is an old concepts, there should be more recent references to it.
2. There's 2 Figure 1 ; one is on page 13 and the other one on page 21 . Figure 1 on page 13 is not elaborated. What happened in each process? The Figure name need to be reformulated.
3. In Table 1 and Table 2, how does the weightage for each criteria specified?
4. What does Table 3 - Table 6 presented?
5. In Figure 1. Integration of MOORA and Rule -based, how does the results consolidated?
6. Recommendation System is a research field by it's own. The prototype system should be considered as Decision Support System, as described earlier in the introductory section.

Reviewer: 2

Comments to the Corresponding Author
Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making

1) In the Introduction, at the end page 4 until the end of page 5, most of the articles written with reporting the previous research with less critical of the works cited. Perhaps the author(s) may include the critical parts with better argument from the previous works. For example, "Mitri (2002) had been successfully described a DSS system based on the Candidate Evaluation (CE) model, which combines the DSS algorithm with a rule-based reasoner for students in various business courses to facilitate knowledge and comprehension, application and analysis, and construction of new knowledge into the research project.", this is an example of reporting without adding the author(s) own voice from the work. The author may add or re-write from the end of page 4 until the end of page 5 with better critical opinion and argument from the previous works.

2) Towards page 6, first paragraph, the author(s) did a great job by including his/her voice in the manuscript. However, at the end of paragraph in page 6, the author(s) repeating the same way writing especially on explanation the methodology of SAW, AHP, TOPSIS, ELECTRE or others before coming to the chosen method which MOORA. It is suggested to the author(s) to give his/her simple opinion from each of the method outlined and try to best describe why MOORA as the chosen method in this works. The author may include a simple table to explain this with her own analysis such previous works done, scope/domain, or others in order to describe this.

3) It is not clear why the focus group discussion involved wih 1 FEP manager, 2 heads of departments, 2 deputy dean, 2 schools' management, and 35 students as participants whereby the author(s) mix together all stakeholders with different backgrounds or experiences in the FGD (why the students included in the FGD? they don't have any FEP experiences yet). The author may elaborate further this part in page 9.

4) The result from the FGD not properly explained in the manuscript. It is suggested to the author to express

Candidate Evaluation (CE) model, which combines the DSS algorithm with a rule-based reasoner for students in various business courses to facilitate knowledge and comprehension, application and analysis, and construction of new knowledge into the research project.", this is an example of reporting without adding the author(s) own voice from the work. The author may add or re-write from the end of page 4 until the end of page 5 with better critical opinion and argument from the previous works.

2) Towards page 6, first paragraph, the author(s) did a great job by including his/her voice in the manuscript. However, at the end of paragraph in page 6, the author(s) repeating the same way writing especially on explanation the methodology of SAW, AHP, TOPSIS, ELECTRE or others before coming to the chosen method which MOORA. It is suggested to the author(s) to give his/her simple opinion from each of the method outlined and try to best describe why MOORA as the chosen method in this works. The author may include a simple table to explain this with her own analysis such previous works done, scope/domain, or others in order to describe this.

3) It is not clear why the focus group discussion involved wih 1 FEP manager, 2 heads of departments, 2 deputy dean, 2 schools' management, and 35 students as participants whereby the author(s) mix together all stakeholders with different backgrounds or experiences in the FGD (why the students included in the FGD? they don't have any FEP experiences yet). The author may elaborate further this part in page 9.

4) The result from the FGD not properly explained in the manuscript. It is suggested to the author to express specifically the possible variables or elements determined from the FGD before goes to MOORA.

5) It is good to include the Fig 1 in the manuscript. However, the author may include/improve the explanation in the figure content such Student: Registration, System: Validity Check, Faculty Database, System: Recapitulation and Data Classification, and Committee: Random Students Placement with the problem identification outlined in the manuscript.

6) In the page 24, the author did mentioned the evaluation of the recommendation system from the survey conducted to the stakeholders. However, it is poorly explained on how the result obtained, methodology explanation, testing parameter, and others which related to the system utilization, procedures, and UAT assessment recommendations. This is the crucial part of the reliability and validity of the research conducted by the author(s).

7) The manuscript has some positive aspects. However, it is suggested to the author(s) not focusing so much to the results instead of properly explaining the a taxonomical categorization of the approaches of MOORA in this essential domain.

---

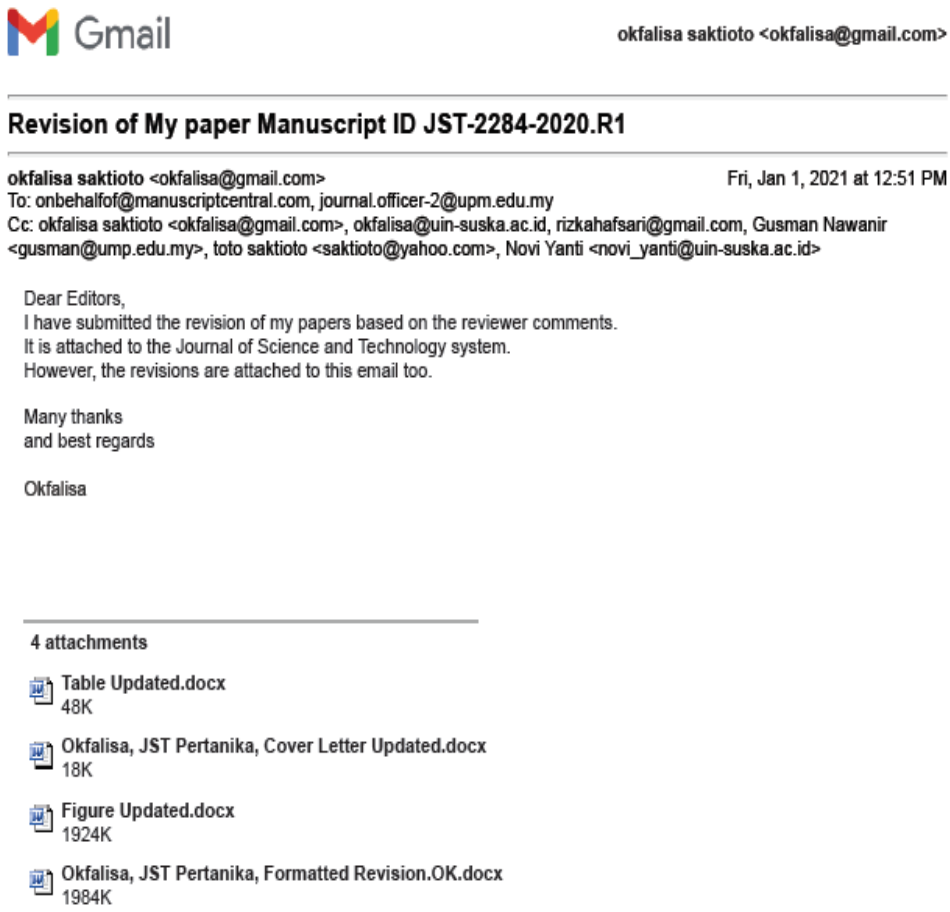
okfalisa saktioto <okfalisa@gmail.com> Thu, Dec 24, 2020 at 7:50 AM
To: executive_editor.pertanika@upm.edu.my

Dear editorial team

Many thanks for your email.
I'll revise the manuscript based on the reviewers" comments

Thank you,

3. Revisi sesuai comentar reviewer disubmit pada 1 Januari 2021.



Gmail okfalisa saktioto <okfalisa@gmail.com>

Revision of My paper Manuscript ID JST-2284-2020.R1

okfalisa saktioto <okfalisa@gmail.com> Fri, Jan 1, 2021 at 12:51 PM
To: onbehalfof@manuscriptcentral.com, journal.officer-2@upm.edu.my
Cc: okfalisa saktioto <okfalisa@gmail.com>, okfalisa@uin-suska.ac.id, rizkahafsari@gmail.com, Gusman Nawanir <gusman@ump.edu.my>, toto saktioto <saktioto@yahoo.com>, Novi Yanti <novi_yanti@uin-suska.ac.id>

Dear Editors,
I have submitted the revision of my papers based on the reviewer comments.
It is attached to the Journal of Science and Technology system.
However, the revisions are attached to this email too.

Many thanks
and best regards

Okfalisa

4 attachments

Table Updated.docx
48K

Okfalisa, JST Pertanika, Cover Letter Updated.docx
18K

Figure Updated.docx
1924K

Okfalisa, JST Pertanika, Formatted Revision.OK.docx
1984K

4. Contoh hasil correction sesuai dengan commentar reviewer dapat dilihat pada Gambar dibawah. Lengkapnya dapat dilihat pada Link dan di **Lampiran**: https://drive.google.com/file/d/1IfvnlA15pTEkOvjzerWFq3tBsjcjSSc_/view

committees, and schools. These three perspectives give a new contribution to a more objective assessment and decision-making by developing a Decision Support System (DSS) towards FEP placement effectiveness. Thus, it provides opportunities for the professional development of new practical teachers. DSS is an application that aids in providing management recommendations in making decisions more objective by considering various alternatives and criteria defined. Understanding the knowledge-based components in decision-making (performance, attitude, and behavior) will enhance managers' influential role and key actors in making decisions (Bonjar et al., 2019). The application of DSS in assisting management decision making, especially in education, has been widely carried out (Delen et al., 2020). The EVALOE- DSS framework for teacher professional development has been recently designed by Gràcia et al. (2020) with the intention of increasingly diverse student linguistic skills. Pardiyono and Indrayani (2019) applied the DSS concept in choosing private higher education based on the marketing mix model criteria. Ardana et al. (2016) developed a DSS model to select blended learning platforms for Mathematic and Information Communication Technology (ICT) learning.

Meanwhile, Ibrahim et al. (2014) integrated the DSS framework for strategic planning in Higher Education Institutions. The above research flourished the significant and successful DSS roles in solving the management, technical, professional, social and culture problems related to decision-making in education

Unfortunately, most of the raised studies deploy a single perspective in solving the complexity of DSS problems. In reality, a synthesis of broad worldviews is essentially developed rather than a single perspective to recognize complex social problems' connectedness. The development of multiple perspectives generates open, honest, effective dialogues and trust among the relevant stakeholders affected by the decision. Hsu et al. (2020) explored the multiple perspectives of experts' evaluation in generating a set of influence criteria in promoting the healthcare industry innovative technologies. Meanwhile, Petkov et al. (2007) studied how the multiple perspective representations of complex managerial problems can support the integration of Multi-Attribute Decision Making (MADM) and soft systems methodologies. El-Gayar and Fritz (2010) presented a web-based multi-perspective DSS for information security planning. Yazdani et al. (2017) have successfully developed a group decision making approach in assisting the multiple perspectives of decision makers and customers values in selecting third-party logistic providers. The result revealed that the multiple perspectives substantially rise in the efficient decision support system towards the quality and reliability of decisions. The multiple perspective approach above has successfully bridged qualitative value judgments with the quantitative data relative criteria to address inquiring organizations' needs. The analysis provided captures the relevant stakeholders' subjective preferences for dealing with conflict priority and presents the trade-offs in a decision fairly.

Moreover, group decision making let the participants boost their ability to learn and stimulate their cognitive level (Carneiro et al., 2020). Therefore, the adoption of three multiple perspectives in this research (i.e., of students, FEP committees, and schools) enhances decision-making effectiveness. More importantly, organizational

5. Mendapat full accepted dari jurnal setelah selesai koreksi reviewer 19 Maret 2021

Gmail okfalisa saktioto <okfalisa@gmail.com>

ACCEPTANCE OF MANUSCRIPT ID. JST-2284-2020.R2 FOR PUBLICATION

1 message

Journal of Science and Technology <onbehalfof@manuscriptcentral.com> Fri, Mar 19, 2021 at 6:31 AM
Reply-To: journal.officer-2@upm.edu.my
To: okfalisa@gmail.com, okfalisa@uin-suska.ac.id
Cc: okfalisa@gmail.com, okfalisa@uin-suska.ac.id, rizkahafsari@gmail.com, gusman@ump.edu.my, saktioto@yahoo.com, novi_yanti@uin-suska.ac.id

19-Mar-2021

Dear Author(s),

I am writing to you in referenoe to an article entitled, "Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making" author(s): Okfalisa, Okfalisa; Hafsari, Rizka; Nawanir, Gusman ; saktioto, saktioto; Yanti, Novi submitted to Pertanika on 28-Oct-2020 for intended publication in JST.

Your paper has been anonymously peer-reviewed by two to three referees competent in the specialized areas appropriate to your manuscript independently evaluating the scientific quality of the manuscript.

I am pleased to tell you that based on the clarity, technical approach and scientific validity presented; your paper has been accepted by the Editorial Board on 03-Feb-2021, and is TENTATIVELY scheduled for publication in JST Vol. 29 (2) Apr. 2021.

I thank you for considering Pertanika as your preferred Journal.

Sincerely,
Journal Officer
Journal of Science and Technology

6. Paper Full Published pada April 2021.

Gmail okfalisa saktioto <okfalisa@gmail.com>

PERTANIKA JOURNAL OF SCIENCE & TECHNOLOGY Vol. 29 | No. 2 | Apr. 2021

1 message

PERTANIKA JOURNALS / UPM <info_pertanika@upm.edu.my> Wed, May 5, 2021 at 7:00 AM
To: okfalisa@gmail.com

PERTANIKA
JOURNAL OF SCIENCE &
TECHNOLOGY

Vol. 29 | No. 2 | Apr. 2021
e-ISSN 2231-8526
ISSN 0128-7680

VIEW JOURNAL

WE'VE PUBLISHED THE LATEST ISSUE OF THE JOURNAL IN OUR WEBSITE

Dear Assoc. Prof. Dr. Okfalisa Okfalisa,

KESIMPULAN:

Paper 5 telah melampirkan bukti korespondensi pengusul dengan pihak editor jurnal.

KESIMPULAN SELURUHNYA:

1. **Paper 1-5 telah dapat melampirkan bukti korespondensi pengusul dengan pihak editor jurnal**

LAMPIRAN 5

BUKTI KORESPONDING AUTHOR

TAMBAHAN BARU

PAPER 5: Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making.

Penulis: Okfalisa Okfalisa, Rizka Hafsari, Gusman Nawanir, Saktioto Toto,Novi Yanti (5 orang), Pertanika Journal Science and Technology, Vol. 9, Issue 2, April 2021.

Gmail okfalisa saktioto <okfalisa@gmail.com>

Re: Manuscript ID JST-2284-2020 - Status Query (Under Review)

1 message

JOURNAL OFFICER MALAR / UPM <journal.officer-2@upm.edu.my> Tue, Dec 15, 2020 at 6:34 AM
To: okfalisa saktioto <okfalisa@gmail.com>
Cc: PERTANIKA EXECUTIVE EDITOR / UPM <executive_editor.pertanika@upm.edu.my>

Dear Author(s),

I refer to your query seeking status for your submitted article entitled "**Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making**" (*Manuscript ID. JST-2284-2020*) for intended publication in Pertanika JST.

I would like to inform you that your manuscript is **under peer-review process** and you shall be contacted by my office once the peer review for your submitted article is **over**, or a decision has been made by the Journal's Editorial Board on the suitability of your article for publication in Pertanika.

NOTE: It normally takes **8-12 weeks** for an article to undergo its peer-review process.

--
(Mrs. Kanagamalar on behalf of Chief Executive Editor)
Please cc your email to *executive_editor.pertanika@upm.edu.my*

Prof. Dato' Dr. Abu Bakar Salleh
Chief Executive Editor (UPM Journals)
PERTANIKA EDITORIAL OFFICE
Bangunan Putra Science Park
1st Floor, Tower II, UPM-MTDC Technology Centre
Universiti Putra Malaysia
43400 Serdang, Selangor, Malaysia

Email 1: journal.officer-2@upm.edu.my (Pertanika JST)
Tel: + 603 9769 1620
Email 2: executive_editor.pertanika@upm.my (Chief Executive Editor)

On Mon, Dec 14, 2020 at 6:47 PM okfalisa saktioto <okfalisa@gmail.com> wrote:

> Dear journal editor,
>
> Please, let me know the review progress of our paper ID JST-2284-2020.R1.
> Title: "Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making".
> Submission on 28 October 2020.
>
> Many thanks and best regards
>
> Okfalisa

Gmail **okfalisa saktioto <okfalisa@gmail.com>**

Journal of Science and Technology - Decision on Manuscript ID JST-2284-2020.R1 (AA)

2 messages

Journal of Science and Technology <onbehalfof@manuscriptcentral.com> Thu, Dec 24, 2020 at 7:00 AM
Reply-To: executive_editor.pertanika@upm.edu.my
To: okfalisa@gmail.com, okfalisa@uin-suska.ac.id
Cc: okfalisa@gmail.com, okfalisa@uin-suska.ac.id, rizkahafsari@gmail.com, abdulhasanuin@gmail.com, gusman@ump.edu.my, zahidahz@iium.edu.my, saktioto@yahoo.com, novi_yanti@uin-suska.ac.id

24-Dec-2020

Dear Assoc. Prof. Okfalisa,

Manuscript ID JST-2284-2020.R1 entitled "Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making" which you submitted to the Journal of Science and Technology, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter. I invite you to respond to the reviewer(s)' comments and revise your manuscript.

To revise your manuscript, log into https://mc.manuscriptcentral.com/upm-jst and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.

You may also click the below link to start the revision process (or continue the process if you have already started your revision) for your manuscript. If you use the below link you will not be required to login to ScholarOne Manuscripts.

*** PLEASE NOTE: This is a two-step process. After clicking on the link, you will be directed to a webpage to confirm. ***

https://mc.manuscriptcentral.com/upm-jst?URL_MASK=119e6154fe6b41e1876851f7f4e524f7

You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using colored text.

Once the revised manuscript is prepared, you can upload it and submit it through your Author Center using the SAME Manuscript ID. JST-2284-2020.R1. Please DO NOT create a new Manuscript ID.

When submitting your revised manuscript, you will be able to respond to the comments made by EACH reviewer (POINT-BY-POINT) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).

IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.

Because we are trying to facilitate timely publication of manuscripts submitted to the Journal of Science and Technology, your revised manuscript should be submitted BEFORE 07 January 2021. If it is not possible for you to submit your revision by this date, we may have to consider your paper as REJECT.

Once again, thank you for submitting your manuscript to the Journal of Science and Technology and I look forward to receiving your revision.

Sincerely,
Chief Executive Editor, Journal of Science and Technology

Reviewer(s)' Comments to Author:

Reviewer: 1

Comments to the Corresponding Author
I found the paper interesting, yet there's few aspects that need to be improved:
1. The citations need to be more recent. Even though DSS is an old concepts, there should be more recent references to it.
2. There's 2 Figure 1 ; one is on page 13 and the other one on page 21 . Figure 1 on page 13 is not elaborated. What happened in each process? The Figure name need to be reformulated.
3. In Table 1 and Table 2, how does the weightage for each criteria specified?
4. What does Table 3 - Table 6 presented?
5. In Figure 1. Integration of MOORA and Rule -based, how does the results consolidated?
6. Recommendation System is a research field by it's own. The prototype system should be considered as Decision Support System, as described earlier in the introductory section.

Reviewer: 2

Comments to the Corresponding Author
Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making

1) In the Introduction, at the end page 4 until the end of page 5, most of the articles written with reporting the previous research with less critical of the works cited. Perhaps the author(s) may include the critical parts with better argument from the previous works. For example, "Mitri (2002) had been successfully described a DSS system based on the Candidate Evaluation (CE) model, which combines the DSS algorithm with a rule-based reasoner for students in various business courses to facilitate knowledge and comprehension, application and analysis, and construction of new knowledge into the research project.", this is an example of reporting without adding the author(s) own voice from the work. The author may add or re-write from the end of page 4 until the end of page 5 with better critical opinion and argument from the previous works.

2) Towards page 6, first paragraph, the author(s) did a great job by including his/her voice in the manuscript. However, at the end of paragraph in page 6, the author(s) repeating the same way writing especially on explanation the methodology of SAW, AHP, TOPSIS, ELECTRE or others before coming to the chosen method which MOORA. It is suggested to the author(s) to give his/her simple opinion from each of the method outlined and try to best describe why MOORA as the chosen method in this works. The author may include a simple table to explain this with her own analysis such previous works done, scope/domain, or others in order to describe this.

3) It is not clear why the focus group discussion involved wih 1 FEP manager, 2 heads of departments, 2 deputy dean, 2 schools' management, and 35 students as participants whereby the author(s) mix together all stakeholders with different backgrounds or experiences in the FGD (why the students included in the FGD? they don't have any FEP experiences yet). The author may elaborate further this part in page 9.

4) The result from the FGD not properly explained in the manuscript. It is suggested to the author to express specifically the possible variables or elements determined from the FGD before goes to MOORA.

5) It is good to include the Fig 1 in the manuscript. However, the author may include/improve the explanation in the figure content such Student: Registration, System: Validity Check, Faculty Database, System: Recapitulation and Data Classification, and Committee: Random Students Placement with the problem identification outlined in the manuscript.

6) In the page 24, the author did mentioned the evaluation of the recommendation system from the survey conducted to the stakeholders. However, it is poorly explained on how the result obtained, methodology explanation, testing parameter, and others which related to the system utilization, procedures, and UAT assessment recommendations. This is the crucial part of the reliability and validity of the research conducted by the author(s).

7) The manuscript has some positive aspects. However, it is suggested to the author(s) not focusing so much to the results instead of properly explaining the a taxonomical categorization of the approaches of MOORA in this essential domain.

---

okfalisa saktioto <okfalisa@gmail.com> Thu, Dec 24, 2020 at 7:50 AM
To: executive_editor.pertanika@upm.edu.my

Dear editorial team

Many thanks for your email.
I'll revise the manuscript based on the reviewers" comments

Thank you,

Okfalisa
[Quoted text hidden]

Gmail

okfalisa saktioto <okfalisa@gmail.com>

Journal of Science and Technology - JST-2284-2020.R2 has been unsubmitted - Incomplete AA

Journal of Science and Technology <onbehalfof@manuscriptcentral.com> Sun, Jan 3, 2021 at 9:33 AM
Reply-To: journal.officer-2@upm.edu.my
To: okfalisa@gmail.com, okfalisa@uin-suska.ac.id
Cc: journal.officer-2@upm.edu.my, executive_editor.pertanika@upm.edu.my

03-Jan-2021

Dear Assoc. Prof. Okfalisa,

Your manuscript, JST-2284-2020.R2, titled "Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making" has been unsubmitted from the Journal of Science and Technology.

I acknowledge receipt of your email and the attachment. However, I notice that you have not indicated your responses to the comments made by EACH reviewer(s) (POINT-BY-POINT) in the space provided. In the absence of such responses, your paper is not likely to receive a favorable decision from the JST Editorial Board.

This issue must be addressed prior to your resubmitting the article to Pertanika using the SAME Manuscript ID. JST-2284-2020. DO NOT create a new Manuscript ID.

Because we are trying to facilitate timely publication of manuscripts submitted to the Journal of Science and Technology, your revised manuscript should be submitted BEFORE 08 January 2021. If it is not possible for you to submit your revision by this date, we may have to consider your paper as REJECT.

You may contact the Editorial Office via email to journal.officer-2@upm.edu.my of by calling 03-9769 1620 if you have further questions.

I look forward to hearing back from you.

Sincerely,
Journal Officer
Journal of Science and Technology Editorial Office

Gmail

okfalisa saktioto <okfalisa@gmail.com>

ACCEPTANCE OF MANUSCRIPT ID. JST-2284-2020.R2 FOR PUBLICATION

1 message

Journal of Science and Technology <onbehalfof@manuscriptcentral.com> Fri, Mar 19, 2021 at 6:31 AM
Reply-To: journal.officer-2@upm.edu.my
To: okfalisa@gmail.com, okfalisa@uin-suska.ac.id
Cc: okfalisa@gmail.com, okfalisa@uin-suska.ac.id, rizkahafsari@gmail.com, gusman@ump.edu.my, saktioto@yahoo.com, novi_yanti@uin-suska.ac.id

19-Mar-2021

Dear Author(s),

I am writing to you in reference to an article entitled, “Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making” author(s): Okfalisa, Okfalisa; Hafsari, Rizka; Nawanir, Gusman ; saktioto, saktioto; Yanti, Novi submitted to Pertanika on 28-Oct-2020 for intended publication in JST.

Your paper has been anonymously peer-reviewed by two to three referees competent in the specialized areas appropriate to your manuscript independently evaluating the scientific quality of the manuscript.

I am pleased to tell you that based on the clarity, technical approach and scientific validity presented; your paper has been accepted by the Editorial Board on 03-Feb-2021, and is TENTATIVELY scheduled for publication in JST Vol. 29 (2) Apr. 2021.

I thank you for considering Pertanika as your preferred Journal.

Sincerely,
Journal Officer
Journal of Science and Technology

Gmail okfalisa saktioto <okfalisa@gmail.com>

URGENT (expiry 48 hours) : SCHEDULED FOR PUBLICATION IN JST VOL. 29 (2) APR. 2021 [JST-2284-2020]

4 messages

Pre Press Farrah <upmjournals.prepress@upm.edu.my> Thu, Apr 15, 2021 at 9:17 AM
To: okfalisa@gmail.com, rizkahafsari@gmail.com, gusman@ump.edu.my, saktioto@yahoo.com, novi_yanti@uin-suska.ac.id
Cc: PERTANIKA EXECUTIVE EDITOR / UPM <executive_editor.pertanika@upm.edu.my>

URGENT: Due to time constraints, your response is compulsory within 48 hours of working days.

Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making

Manuscript ID. JST-2284-2020

SCHEDULED FOR PUBLICATION IN JST VOL. 29 (2) APR. 2021

Thank you for choosing Pertanika as your preferred journal.

I am pleased to tell you that your manuscript titled above is currently undergoing the publication process and is **time-bound**.

Please respond to comment(s) (if any) placed by Pre-press officer in your PDF file. If not, your article will be pulled out (subjected to CEE decision) from this issue for irresponsiveness.

If your article does not contain any comment(s) from Pre-press officer, please respond accordingly if you agree to publish your article as it is without any corrections from your end.

Your article *(softcopy in PDF)* is attached for your **immediate and thorough** proofreading. Indicate any changes in your manuscript in the pdf version attached. Use **RED** for **minor addition** and **BLUE** for **minor deletion**. **Please note that you are NOT PERMITTED to make any major changes or revert to any other version of the file,** including deleting or adding any substantial text. You are also not permitted to either add, delete author names or alter the authorship sequence as was provided at the initial time of submission.

Alternatively, if you do not wish to use the PDF editor, you may list out the corrections or minor changes on a separate **Microsoft word** or a notepad file.

Please send your **reply within 48 hours** *(working days)* of this email, at the latest **before 12.00 p.m. on the 19 April 2021 (Monday).**

--

Publication Officer
***(Nur Farrah Dila Ismail** on behalf of Chief Executive Editor)*

Please cc your email to *executive_editor.pertanika@upm.edu.my*

Chief Executive Editor (UPM Journals)
JOURNAL DIVISION | UPM Press
Office of the Deputy Vice Chancellor (R&I)
Universiti Putra Malaysia

facebook https://www.facebook.com/pertanika/

Website: http://www.pertanika.upm.edu.my/

JST-2284-2020.pdf
645K

---

okfalisa saktioto <okfalisa@gmail.com> Thu, Apr 15, 2021 at 9:38 AM
To: Pre Press Farrah <upmjournals.prepress@upm.edu.my>
Cc: rizka hafsari <rizkahafsari@gmail.com>, Gusman Nawanir <gusman@ump.edu.my>, saktioto@yahoo.com, novi_yanti@uin-suska.ac.id, PERTANIKA EXECUTIVE EDITOR / UPM <executive_editor.pertanika@upm.edu.my>

Dear Pre Press Farrah.

My Article:

Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making

Manuscript ID. JST-2284-2020

DOES NOT CONTAIN ANY COMMENTS FROM PRE-PRESS OFFICER. PLEASE PROCEED WITH PUBLICATION.

Many thanks and Best Regards

Corresponding Author,
Okfalisa

[Quoted text hidden]

Pre Press Farrah <upmjournals.prepress@upm.edu.my> Thu, Apr 15, 2021 at 11:21 AM
To: okfalisa saktioto <okfalisa@gmail.com>
Cc: rizka hafsari <rizkahafsari@gmail.com>, Gusman Nawanir <gusman@ump.edu.my>, saktioto@yahoo.com, novi_yanti@uin-suska.ac.id, PERTANIKA EXECUTIVE EDITOR / UPM <executive_editor.pertanika@upm.edu.my>

Dear author,

Greetings.

Noted with many thanks for the prompt response. We will proceed with the publication of your article as it is.

Stay safe and have a nice day.
[Quoted text hidden]

---

okfalisa saktioto <okfalisa@gmail.com> Thu, Apr 15, 2021 at 12:14 PM
To: Pre Press Farrah <upmjournals.prepress@upm.edu.my>
Cc: rizka hafsari <rizkahafsari@gmail.com>, Gusman Nawanir <gusman@ump.edu.my>, toto saktioto <saktioto@yahoo.com>, Novi Yanti <novi_yanti@uin-suska.ac.id>, PERTANIKA EXECUTIVE EDITOR / UPM <executive_editor.pertanika@upm.edu.my>

Thank you, you too.
[Quoted text hidden]

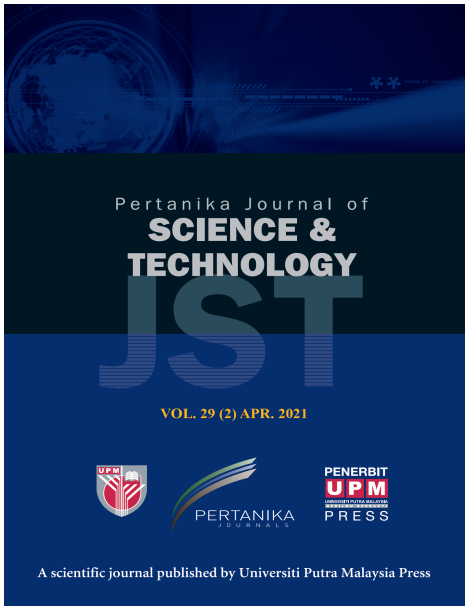
Gmail

okfalisa saktioto <okfalisa@gmail.com>

PERTANIKA JOURNAL OF SCIENCE & TECHNOLOGY Vol. 29 | No. 2 | Apr. 2021

1 message

PERTANIKA JOURNALS / UPM <info_pertanika@upm.edu.my> Wed, May 5, 2021 at 7:00 AM
To: okfalisa@gmail.com



PERTANIKA
JOURNAL OF SCIENCE &
TECHNOLOGY

Vol. 29 | No. 2 | Apr. 2021
e-ISSN 2231-8526
ISSN 0128-7680

VIEW JOURNAL

WE'VE PUBLISHED THE LATEST ISSUE OF THE JOURNAL IN OUR WEBSITE

Dear Assoc. Prof. Dr. Okfalisa Okfalisa,

Greetings from Pertanika Journals.

We are pleased to announce that your paper titled **Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making** has been published on 30 April 2021 in the Journal Of Science & Technology (JST), **Volume 29 (2) Apr. 2021** and is now live on the Pertanika Journal's website.

You may view or download the complete issue here. You are encouraged to share this information with interested parties. I shall be happy to have your comments and suggestions.

1. High Level Synthesis Optimizations of Road Lane Detection Development on Zynq-7000

Panadda Solod, Nattha Jindapetch, Kiattisak Sengchuai, Apidet Booranawong, Pakpoom Hoyingcharoen, Surachate Chumpol and Masami Ikura

2. Farmers' Participation in Irrigation Management in the Punggur Utara Irrigation Area, Indonesia

Dyah Indriana Kusumastuti, Vera Chania Putri, Dwi Jokowinarno and Endro Prasetyo Wahono

3. Pseudo-colour with K-means Clustering Algorithm for Acute Ischemic Stroke Lesion Segmentation in Brain MRI

Abang Mohd Arif Anaqi Abang Isa, Kuryati Kipli, Ahmad Tirmizi Jobli, Muhammad Hamdi Mahmood, Siti Kudnie Sahari, Aditya Tri Hernowo and Sinin Hamdan

4. Improved High Dynamic Range for 3D Shape Measurement based on Saturation of the Coloured Fringe

Shanyu Chua, Chee Chin Lim1, Swee Kheng Eng, Yen Fook Chong and Chiun Tai Loh

5. The Built Environment and its Impact on Transit based Transportation Users Walking Activity in Semarang, Indonesia

Anita Ratnasari Rakhmatulloh, Diah Intan Kusumo Dewi and Dinar Mutiara Kusumo Nugraheni

6. Ethylene Yield from a Large Scale Naphtha Pyrolysis Cracking Utilizing Response Surface Methodology

Mohamad Hafizi Zakria, Mohd Ghazali Mohd Nawawi1 and Mohd Rizal Abdul Rahman

7. Smartphone Application Development for Rice Field Management Through Aerial Imagery and Normalised Difference Vegetation Index (NDVI) Analysis

Nor Athirah Roslin, Nik Norasma Che'Ya, Rhushalshafira Rosle and Mohd Razi Ismail

Nurul Azifah Mohd Pauzi, Yap Bee Wah, Sayang Mohd Deni, Siti Khatijah Nor Abdul Rahim and Suhartono

16. Robust Multivariate Correlation Techniques: A Confirmation Analysis using Covid-19 Data Set

Friday Zinzendoff Okwonu, Nor Aishah Ahad, Joshua Sarduana Apanapudor and Festus Irismisose Arunaye

17. Generalized Fibonacci Search Method in One-Dimensional Unconstrained Non-Linear Optimization

Chin Yoon Chong, Soo Kar Leow and Hong Seng Sim

18. Mathematical Modeling and Availability Analysis of Leaf Spring Manufacturing Plant

Sohan Lal Tyagi, Shikha Bansal, Priyanka Agarwal and Ajay Singh Yadav

19. Penalized LAD-SCAD Estimator Based on Robust Wrapped Correlation Screening Method for High Dimensional Models

Ishaq Abdullahi Baba, Habshah Midi, Leong Wah June and Gafurjan Ibragimove

20. Relative Risk Estimation for Human Leptospirosis Disease in Malaysia Based on Existing Models and Discrete Space-Time Stochastic Sir Model

Sufi Hafawati Ideris, Muhammad Rozi Malim and Norshahida Shaadan

21. Factors in Ergonomic Design of 6-to-18-month Baby Carriers for Elderly People

Ariya Atthawuttikul and Sorat Khongkharat

22. Numerical Analysis of the Crack Inspections Using Hybrid Approach for the Application the Circular Cantilever Rods

Saddam Hussein Raheemah, Kareem Idan Fadheel, Qais Hussein

Hassan, Ashham Mohammed Ened, Alaa Abdulazeez Turki Al-Taie and Hussein Kadhim Sharaf

23. Radiation Modified CS/PVA Film with PVP Coating as Cu Adsorbent Material

Norhashidah Talip, Amalina Muhammad Afifi, Mohd Yusof Hamzah, Maznah Mahmud and Sarada Idris

24. An Investigation on Indoor Temperature of Modern Double Storey House with Adapted Common Passive Design Strategies of Malay Traditional House

Maryam Qays Oleiwi and Mohd Farid Mohamed

25. Assessment by Simulation of Different Topological Integration of Solar Photovoltaic Plant in Medium Voltage Distribution Networks

Md. Milon Uddin, Mushfiqur Rahman, Md. Tanzid Ridwan Hossain and Md. Habibur Rahman

26. Volume Transport Variability in the Western Equatorial Pacific and its Relations to Halmahera Throughflow

Marlin Chrisye Wattimena, Agus Saleh Atmadipoera, Mulia Purba, I Wayan Nurjaya and Fadli Syamsudin

27. Solution of Collinearity Problem in Two-Dimensional Electrical Resistivity Tomography using Wenner Array

Mustapha Adejo Mohammed, Nordiana Mohd Muztaza and Rosli Saad

28. Potential Groundwater Exploration in Use of 2-D Electrical Resistivity Tomography (ERT) Techniques at the Department of Agriculture Kelantan Research and Developmental Platform Padang Raja Kelantan

Wan Fazilah Fazlil Ilahi, Nur Hidayu Abu Hassan, Mohd Razi Ismail, Nik Norasma Che'Ya, Zulkarami Berahim, Mohamad Husni Omar, Nurul Idayu Zakaria and Mohamed Azwan Mohamed Zawawi

29. Efficacy of Intelligent Mosquito System (I.M.O.S) with Xmos Mini Aerosol Against *Aedes* in 17th College, Universiti Putra Malaysia

Latifah Saiful Yazan, Banulata Gopalsamy, Siti Najiha Abu Bakar, Khairul Aiman Manan, Noranis Shahida Shahidan and Lee Yean Wang

30. Modelling *In-situ* Factors Affecting Bud's Growth of *Rafflesia kerrii* Meijer in Lojing Highlands, Kelantan, Peninsular Malaysia

Abdul Hamid Mar Iman, Nor Hizami Hassin, Muhamad Azahar Abas and Zulhazman Hamzah

31. Ecological Roles of Benthic Community in Seafloor Northwards of Pulau Indah, Klang, Malaysia

Mohd Sophian Mohd Kasihmuddin and Zaidi Che Cob

32. Radiographic Measurement of Cochlear in Sudanese Population using High Resolution Computed Tomography (HRCT)

Lubna Bushara, Mohamed Yousef, Ikhlas Abdelaziz, Mogahid Zidan, Dalia Bilal and Mohammed El Wathig

33. Prevalence of Vitreous & Retinal Disorders among Sudanese Diabetic Patients: A B-Scan Ultrasonography Study

Mohamed Yousef, Safaa Bashir, Awadalla Wagealla, Mogahid Zidan, Mahmoud Salih Babiker and Mona Mohamed

34. Polylactide and its Composites on Various Scales of Hardness

Abraham Kehinde Aworinde, Eyere Emagbetere, Samson Oluropo Adeosun and Esther Titilayo Akinlabi

35. SETS: A Seed-Dense-Expanding Model-Based Topological Structure for the Prediction of Overlapping Protein Complexes

Soheir Noori, Nabeel Al-A'araji and Eman Al-Shamery

LATEST MANUSCRIPTS

The journal is indexed in SCOPUS (Elsevier), Clarivate-Emerging Sources Citation Index (WoS), BIOSIS, Google Scholar, Microsoft Academic, MyCite, EBSCO, National Agricultural Library, Asean Citation Index and ISC.

You are invited to submit your research papers for possible publication in Journal Of Science & Technology (JST). The Journal accepts articles as **regular**, **short communication** or **review papers**. Proposals for **Special Issues** are welcomed. Pertanika Journal is the resource to support you in strengthening your research.

For guidance on the submission process, or for any questions regarding submissions, you may view the Online Submissions Guide here.

Best regards,

Chief Executive Editor, UPM Journals
Universiti Putra Malaysia
www.pertanika.upm.edu.my

An Integration of MOORA and Rule-Based Decision Making

Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making

Okfalisa Okfalisa[1*], Rizka Hafsari[1], Gusman Nawanir[2], Saktioto Toto[3] and Novi Yanti[1]

[1]Informatics Engineering Department, Universitas Islam Negeri Sultan Syarif Kasim Riau, 28293 Pekanbaru, Riau, Indonesia.
[2]Faculty of Industrial Management, Universiti Malaysia Pahang, 26300 Kuantan, Pahang, Malaysia
[3]Physic Department in Universitas Riau, 28293 Pekanbaru, Riau, Indonesia

okfalisa@gmail.com (Okfalisa Okfalisa), +6282386801721
rizkahafsari@gmail.com (Rizka Hafsari), +6282390272837
gusman@ump.edu.my (Gusman Nawanir), +60164161410
saktioto@yahoo.com (Saktioto Toto), +628127658986
novi_yanti@uin-suska.ac.id (Novi Yanti), +628126889515
* Corresponding author

List of Table/Figure:

Optimizing Placement of Field Experience Program: An Integration of MOORA and Rule-Based Decision Making

ABSTRACT

The lack of optimality in the Field Experience Program (FEP) placement has affected universities' educational services to the stakeholders. Bringing together the stakeholders' needs, university capacities, and participants' willingness to quality and quantity is not easy. This study tries to optimize the placement of FEP by considering the interests of multiple perspectives through the application of Multi-Objective Optimization on the Basic of Ratio Analysis (MOORA) and Rule-Based methods in the form of a decision-making model. MOORA ranked the students based on the FEP committee's perspective and other criteria, such as micro-teaching grades, final GPAs, study programs, number of credits, and student addresses. Meanwhile, the school perspective was ordered based on its accreditations, levels, types, facilities, and performances. To achieved the optimal recommendation of FEP placement, the integration of MOORA and Rule-based intertwined the requirement of such perspectives. A prototype of the system recommendation is then acquired to simplify the decision-making model. As adjudications, a survey from twenty stakeholders evidenced around 86.92% of system user acceptances. The confusion matrix testing defines the accuracy of this method reaches 78.33%. This paper reveals that the recommendation model has been successfully increasing the effectiveness of decision making in FEP placement under the needs and expectations of the entire stakeholders.

Keywords: Multi-Objective Optimization on the Basic of Ratio Analysis, Decision Support System, Rule-Based, Recommendation System, Multiple Perspectives, Optimization.

INTRODUCTION

The FEP is a program to improve students' quality, a mandatory requirement before taking the final assignment course at the Faculty of Education and Teacher Training. In this program, the students carry out teaching practices and other academic activities at junior and senior high school levels set by the FEP committee for two months. Based on interviews with FEP committees, several obstacles were found, including ineffective administrative procedures, which took a long time to access and overload student placements in one school. Besides, some complaints are considered related to the quality and imbalance of student competencies delivered by school needs. The school mileage factor also becomes an obstacle for the students in applying discipline and finance in implementing programs. This equip became a significantly affecting issue, especially for initial teachers in establishing their professional identities (Gang et al., 2020). Feelings of professional unease and discomfort during the first year of teaching regarding the teacher educators' substantial and situational selves kindly influence new pedagogies and the confident practitioner towards achieving new professional identity (Julie and Katie, 2017). The initial teachers require adequate induction support to analyze the knowledge, interpret and understand the education environment setting, mission statement, curriculum, and precise nature of work; and understand the teaching. These processes help the new teacher educator evolve their epistemic, overview knowledge of schooling, the establishment and extended of pedagogy, and provide a potential platform for evaluating what to teach, when, and how (Jones et al., 2020). The world of education continues to grow and is greatly influenced by the development. Thus, it directly affects the educational system. Teachers are responsible for operating the educational system and ensuring the sustainable achievement of schools' objectives and curriculum. To date, a strong and efficient professional competency of teachers should be redefined on the development of human life and education as field competencies, pedagogical competencies, research competencies, curriculum competencies, lifelong learning competencies, social-cultural competencies, emotional competencies, communication competencies, information and communication technologies competencies and environmental competencies (Selvi, 2010). The above competencies imply developing students' competencies towards acquiring self-confidence, learning motivation, and social skills (Chan and Yeung,

2019). This issue aims to allow academics in the field to study and assess their lessons and skills critically. Yeo et al. (2008) found that teachers' efficacy in instruction, classroom management, and student engagement influenced the teacher attributes and the teacher-student relationship. Zendarski et al. (2020) examined the teacher characteristics, thus relating to the social culture competencies that significantly contributed to the child-teacher relationship quality.

In a nutshell, this research tries to respond to the importance of the teacher's roles on the student education in schools, mostly related to the formation of professionalism of the new teachers; a high demand of policy and effective mechanism during the placement of students as prospective teachers in this FEP; and the consideration of stakeholders' perspectives at the side of students' needs, FEP committees, and schools. These three perspectives give a new contribution to a more objective assessment and decision-making by developing a Decision Support System (DSS) towards FEP placement effectiveness. Thus, it provides opportunities for the professional development of new practical teachers. DSS is an application that aids in providing management recommendations in making decisions more objective by considering various alternatives and criteria defined. Understanding the knowledge-based components in decision-making (performance, attitude, and behavior) will enhance managers' influential role and key actors in making decisions (Bonjar et al., 2019). The application of DSS in assisting management decision making, especially in education, has been widely carried out (Delen et al., 2020). The EVALOE- DSS framework for teacher professional development has been recently designed by Gràcia et al. (2020) with the intention of increasingly diverse student linguistic skills. Pardiyono and Indrayani (2019) applied the DSS concept in choosing private higher education based on the marketing mix model criteria. Ardana et al. (2016) developed a DSS model to select blended learning platforms for Mathematic and Information Communication Technology (ICT) learning.

Meanwhile, Ibrahim et al. (2014) integrated the DSS framework for strategic planning in Higher Education Institutions. The above research flourished the significant and successful DSS roles in solving the management, technical, professional, social and culture problems related to decision-making in education

fields. Herein, the performance of the FEP program through the practice of DSS approach is strongly optimistic.

Unfortunately, most of the raised studies deploy a single perspective in solving the complexity of DSS problems. In reality, a synthesis of broad worldviews is essentially developed rather than a single perspective to recognize complex social problems' connectedness. The development of multiple perspectives generates open, honest, effective dialogues and trust among the relevant stakeholders affected by the decision. Hsu et al. (2020) explored the multiple perspectives of experts' evaluation in generating a set of influence criteria in promoting the healthcare industry innovative technologies. Meanwhile, Petkov et al. (2007) studied how the multiple perspective representations of complex managerial problems can support the integration of Multi-Attribute Decision Making (MADM) and soft systems methodologies. El-Gayar and Fritz (2010) presented a web-based multi-perspective DSS for information security planning. Yazdani et al. (2017) have successfully developed a group decision making approach in assisting the multiple perspectives of decision makers and customers values in selecting third-party logistic providers. The result revealed that the multiple perspectives substantially rise in the efficient decision support system towards the quality and reliability of decisions. The multiple perspective approach above has successfully bridged qualitative value judgments with the quantitative data relative criteria to address inquiring organizations' needs. The analysis provided captures the relevant stakeholders' subjective preferences for dealing with conflict priority and presents the trade-offs in a decision fairly.

Moreover, group decision making let the participants boost their ability to learn and stimulate their cognitive level (Carneiro et al., 2020). Therefore, the adoption of three multiple perspectives in this research (i.e., of students, FEP committees, and schools) enhances decision-making effectiveness. More importantly, organizational learning continues towards sustainable gains in productivity and organizational excellence. Many methods have been applied in figuring out the problems related to MADM, including the simple additive weighting method (SAW) (Engel et al., 2017), the analytic hierarchy process (AHP) (Fox et al, 2015; Okfalisa et al., 2018, and Leny and Okfalisa, 2019), and the technique for order preference by similarity to ideal solution (TOPSIS) (Conejero et al., 2020), ELECTRE (Mishra et al., 2020) and the

latest is MOORA (Okfalisa et al., 2020). Besides, Martusorn et al. (2019) tried to compare the effectiveness of SAW, AHP, and TOPSIS in selecting a suitable warehouse location. The existing techniques have exclusively addressed their benefits and highlighted the attributes of various analyses such that their value can be clarified by using the technique-based of case completion efficiently. As comparatively, the AHP approach and its derivatives, including ANP, Fuzzy AHP, and Fuzzy ANP have intensity emphasizes resolving the bias of weight assessment and analysis sensitivity (Okfalisa et al., 2021). The reviews of MADM methods are disclosed at Table 1.

Table 1

The Reviews of MADM Approaches

MADM Approach	Advantages	Method Extension	Reference
AHP	1. Focus on weighting of evaluation criterion. 2. Determine the significant weight and prioritize of criterion 3. Dealing with human bias during the knowledge transformation of decision makers	AHP-Entropy; AHP-OMAX; Fuzzy AHP; Fuzzy C Mean (FCM) – Fuzzy AHP; Quality Function Deployment (QFD) – Fuzzy ANP; Fuzzy AHP; ANP	Du et al. (2020); Okfalisa et al. (2018); Mangla et al. (2017); Kazemi et al. (2020); Mistarihi et al. (2020); Li et al. (2020)
SAW	1. Commonly applied for converted negative criteria into positive value. 2. Determine the weighted summation values for each alternative and assessment criteria. 3. Finding the complete ranking of the alternatives	SAW-HFL Additive Ratio Assessment (ARAS); AHP – SAW; Fuzzy SAW and Fuzzy TOPSIS; Fuzzy SAW	Büyüközkan et al. (2020); Kumar et al. (2019); Roszkowska et al. (2016); Mukodimah et al. (2018); Engel et al. (2017)
TOPSIS	1. Can be used to determine the weights of decision makers 2. Commonly applied for ranking the alternatives	Fuzzy TOPSIS; TOPSIS; TOPSIS with Hesitant Pythagorean Fuzzy Sets.	Gündoğdu and Kahraman (2019); Kacprzak (2019); Liang and Xu (2017); Memari et al. (2019);

	and to select the best one 3. Considering both positive-ideal and negative-ideal solutions in decision-making.		De Farias Aires et al. (2019); Martusorn et al. (2019); Conejero et al. (2020).
ELECTRE	1. Can be used to calculate and rank the criteria and alternatives. 2. Famous for its outranking relations to rank a set of alternatives. 3. Applied to determine the concepts of concordance and discordance relations among alternatives. 4. Effective application in group decision-making environment	Intuitionistic Fuzzy (IF)-DEMATEL and IF-ELECTRE; ELECTRE III with weighted Borda rule; ELECTRE; ELECTRE and Pythagorean Fuzzy Sets	Kilic et al. (2020); Liao et al. (2020); Fei et al. (2019); Mishra et al. (2020); Akram et al. (2019).
MOORA	1. Overing some of the available decision-making methods include fewer mathematical computations, less computational time, more simplicity, and more stability compared with other MADM 2. Proposing optimum materials and stable ranking result. 3. One of the latest MADM methods that covers the weakness of other older methods. 4. Has been applied in many selections case study and fields of research background.	FCM – MOORA; Fuzzy MOORA; Fuzzy MOORA – FMEA; MOORA; MULTIMOORA; AHP-MOORA; MOORA and Goal Programming; MOORA and DEMATEL-ANP; MOORA-based Taguchi	Dabbagh and Yousefi (2019); Emovon et al. (2020); Arabsheybani et al. (2018); Shihab et al. (2018); Omrani et al. (2019); Yusuf (2019); Patnaik et al. (2020); Dinçer et al. (2019); Liang et al. (2020).

MOORA was first introduced by Brauers and Zavadskas (2006) to work out the various complex and conflicting decision-making issues for optimal decision purposes. MOORA responds to the representative alternatives concerning that particular objective by calculating the square root of each alternative's sum of squares per objective chosen (Brauers, 2008). MOORA accommodates multiple criteria in simple computational procedures. Thus, a particular single equation is required for decision matrix normalization irrespective of the nature criteria (Madić et al., 2015). This technique has been successfully showing the perfect correlation for order preference to the ideal solution. It is not affected by introducing any additional parameters (Stanujkic et al., 2012) and undefined of the criteria weights (Chakraborty, 2011). MOORA can simultaneously consider the numbers of quantitative and qualitative selection attributes (Gadakh et al., 2013).

The MOORA application in various scientific fields has been carried out, including MOORA and Goal Programming for solving credit lending decision-making problems for real-time commercial banking environment (Yusuf, 2019), AHP-MOORA for solving the composite material selection for structural component development. Herein, the ration system, multiplicative, and the reference point of MOORA used to compare and rank the proposed materials (Patnaik et al., 2020), Integrated MOORA and DEMATEL-ANP to provide optimum sensitivity analysis and consistency decision-makers' priorities for the recommendation of the financial service in E7 economy evolution (Dinçer et al., 2019), Application of MOORA-based Taguchi method for predicting the optimal welding parameters by considering the multiple quality of perspectives (Liang et al., 2020), MOORA and FCM as a hybrid decision-making system for prioritizing Occupational Health and Safety (OHS) risks based on the proposed weight of FCM approach (Dabbagh and Yousefi, 2019). As a result, the previous works derived that MOORA can consider all the attributes essential and provided a better accurate evaluation of the alternatives. Arabsheybani et al. (2018) also found that MOORA accommodated the optimum decision-making methods with uncomplicated mathematical computations, low execution time, more simplicity, and revealed stable ranking result compared with others MADM techniques.

Moreover, the sensitivity analysis approach of MOORA continues to evolve and be enhanced through the integration process with various MADM approaches.

Therefore, this study applies the MOORA method in prompting the proposed alternatives by each perspective. Every perspective has measurable attributes to quantitatively well-defined the alternative solutions, viz., micro-teaching grades, final GPA, study programs, number of credits and student address, the school accreditation, the school level, the school type, the school facilities, and the school performance. The objective consists of the optimization model as well as maximization or minimization of an attribute. The satisfaction of all perspectives becomes the primary consideration that must be revealed in this research. Herein, MOORA defines the robustness in connection with multiple objectives and conditions set in this case.

Furthermore, to inextricably link the MOORA optimization ranking from both perspectives, a rule-based concept with forwarding chaining inference is applied. Rule-based is capable of selecting the minimal and representative criteria objectively and reliably for forming the MADM model and overlooking the inter-relationships among the involved criteria towards the continuous improvement and the measurement of underestimated effect of non-additive aggregators (You et al., 2019). By deploying the rule bases, the MADM method can translate decision-makers' knowledge and explanation facilities into quantitative and qualitative analytical functions. The integration of body knowledge in MADM and the expert system paradigm is represented by a MOORA and Rule-based embodiment, thus explicitly articulating the stakeholders' knowledge about a particular decision-making issue. Thus, the recommendations given are expected to meet each perspective's needs and interests by considering the defined criteria' value.

The suitable pair proposed is, without a doubt, the most incredible combination according to the parameters' significance. As a limitation, this research was conducted on the execution of the FEP at Education and Teacher Training Faculty of Universitas Islam Negeri Sultan Syarif Kasim Riau, which involved a total number of 1,036 students in the year 2018/2019 from seven study programs, including the Islamic Religious Education, Arabic Language Education, English Language

Education, Economic Education, Chemical Education, Mathematics Education, and Counseling Guidance.

MATERIALS AND METHODS

Several activities carried out this research. First, the problem identification process was put into practice qualitatively through interviews and focus group discussion with one FEP manager, two heads of departments, two deputy dean, two schools' management, and thirty-five students as participants. The FEP managers, head departments, deputy dean, and schools' management were asked to handle this program. Meanwhile, the representative students from the post participants were discussed their problematics and expectation of this program. As a result, a pattern of the FEP procedure was defined. The emerging of various obstacles encountered during the execution from both perspectives. Several possible variables were also formulated and proposed as criteria, such as the students perceives criteria viz., the value of micro-teaching (C1), final GPA (C2), program study (C3), credit numbers (C4), and student address (C5). Concurrently, the school apprehends criteria expressly school accreditation (C1), school level (C2), school type (C3), school facilities-Wifi (C4), school facilities-labour (C5), school facilities-library (C6), school facilities-air conditioner (C7), and school performance-Adiwiyata (C8). The determination of criteria weight for the FEP placement was set during the discussion (details are described in the Result and Discussion section). Quantitative literature reviews have been structured to reinforce the formulation of standards. As the main activity, the optimization analysis of current program participants delegated by forty students and ten schools was preliminarily examined through MOORA.

A series of MOORA flow processes is followed, namely the formation of matrices, the determination of normalized matrices, the determination of weighted normalization matrices, and the determining preference values.

1. Matrix Formation

$$Xij = \begin{bmatrix} X11 & X12 & X1n \\ X21 & X22 & X2n \\ Xm1 & Xm2 & Xmn \end{bmatrix} \quad (2.1)$$

xij = the result of matrix formation

x = the value of each criterion

i = the criterion value

j = the alternative value

m = the criterion value to m

n = the alternative value to n

2. Normalize matrix determination

$$\overline{xij} = \frac{xij}{\sqrt{\sum_{j=1}^{m} x^2{}_{ij}}} \quad (2.2)$$

(j = 1, 2…, n)

$\overline{xij}$ = the average of the *i-th* criteria to the value of the *j-th* criteria

xij = the matrix formation

i = the value derived from the number of criteria

j = the value derived from the number of alternatives

n = the number of alternative values up to *n*

3. Weighted normalize matrix determination

$$yi = \sum_{j=1}^{g} Xij * \sum_{j=g+1}^{n} Wj \quad (2.3)$$

yi = the result of weighted matrix multiplication

wj = the weight value of the j-th criterion

xij = values of each matrix formation

4. Preference value determination

$$yi = \sum_{j=1}^{g} WjXij - \sum_{j=g+1}^{n} WjXij \quad (2.4)$$

yi = the result of weighted matrix multiplication

wj = the weight value of the j-th criterion

xij = values of each matrix formation

Finally, the highest rank of student and school alternatives was merged using the rule-based to track the appropriate recommendation pair. A decision tree diagram is then developed based on the association rules defined by the stakeholders. To automate the integration of MOORA and rule-based calculation, a prototype DSS was constructed. Object-Oriented and Unified Modeling Language (UML) tools were applied in system analysis and design. These tools have demonstrated a promising future as a pragmatic methodology in modelling DSS, including user interface, architectural design, analysis and design, programming, data management, and model management (Liu and Stewart, 2004). The visualization derives from this powerful approach is capable in interactively express the immersive learning of information and knowledge of the respondent, as examples Kumar et al. (2019) designed web-based object-oriented decision support system for coastal water quality prediction and Sztubcka et al. (2020) deployed Geographic Information Systems as innovative DSS in identifying the potential location for energy efficiency improvement. Thus, the adoption of the object-oriented technique has been successfully generated the dynamic analytical and development of multi-attribute decision making components of DSS. Furthermore, Blackbox Testing, User Acceptance Testing (UAT), and Confusion Matrix were systematically organized in testing the work out functionality, the user responses, and the accuracy comparison for 120 test data simulation. Blackbox testing and UAT are commonly and effectively applied for software development testing (Pressman and Maxim, 2020).

Below is the description of the Confusion Matrix. It is acceptable and straightforward for classification algorithms and area estimation models (Lewis and M.Brown, 2001; Han at al., 2011).

$$Accuracy = \frac{TP+TN}{P+N}\ x\ 100\% \quad (2.5)$$

$$\text{Error-rate} = \frac{FP+FN}{P+N}\ x\ 100\% \quad (2.6)$$

TP (True Positive) = The amount of correctly classified data (*Actual class (yes), Predicted class (yes)).*

TN (True Negative) = The amount of correctly classified data (*Actual class (no), Predicted class (no)).*

FN (False Negatif) = The amount of incorrectly classified data (*Actual class (yes), Predicted class (no)).*

FP (False Positif) = The amount of incorrectly classified data (*Actual class (no), Predicted class (yes)).*

P = Total of *TP* and *FN*

N = Total of *FP* and *TN*

Blackbox Testing is a structural software evaluation technique used to analyze system functionality, requirement analysis validation, system integration relates to the codification review, acknowledging the customer's requirement analysis phase, and the system regression test (Nidhra, 2012; and Copeland, 2004). Meanwhile, UAT is conducted by disseminating the questionnaire with five Linkert scales to measure the respondents' agreement related to the system utilization, procedures, and the recommendations offered by this prototype DSS system (Davis, 2004). UAT is essential in grabbing information and profound knowledge relevant to the validation and acceptance of the solution.

RESULTS AND DISCUSSIONS

Problem Identification

Based on the observations and interviews, the flow of FEP student placement activities is described in Figure. 1. The current system was manually performed and randomly positioned without considering any particular criteria. Students enrolled for the FEP program at the front desk of committee services. Next, the committee checked the validity of documents' requirements by referencing the faculty data, including students' status, micro-teaching score, final GPA, study programs, and credits. The committee applied word and excel programming to make the recapitulation and data classification. Finally, the committee randomly placed the students for the FEP program. The FEP placement report will be announced and conducted based on the proposed date and schools. As a result, manually operated of registration, data validation, and data recapitulation triggered the un-effective time management on the side of committee services. Lack of students' discipline during the registration process caused the target's achievement not to set as expected. The committee services were disappointed on the schools' side, especially regarding time management, students' quality and competencies, students' discipline, students' requirements, and quota allocation. By referring to Indonesia's government regulation No. 13 the Year 2015 about national education standard, Indonesia Ministry of Environment No. 05 the Year 2013, and focus group discussion summary during the interview session, student performance can be assessed through the score value of micro-teaching, final GPA, program study, numbers of credits, and students' location. Microteaching provides a space for the pre-service teacher to evaluate their teaching (Saban et al., 2013) by considering the timing, planning, asking questions, management of the class, materials usage, and physical appearance in front of the class. The value of micro-teaching practices contributes to the pre-service teachers' qualifications and experiences. Hemdi et al. (2016) found that the cumulative GPA recognized as the holistic student academic assessment mechanism clearly described their actual ability, knowledge, skills, and attitude. Understanding GPA is beneficial for the students, faculty, university, and external stakeholders in identifying the students' strengths and weaknesses for vacancy allocation. Concurrently, the school appraisal encompasses the school accreditation, the school level, the school type, the

school facilities, and the school performance. School accreditation evaluates the school's quantitative educational quality judgment of facilities, resources, and teaching. The accreditation mirrors the broad aspects of teacher competencies and values during the educational program (Davis and Ringsted, 2006). Cherchye et al. (2010) exhibited that environmental characteristics in terms of the school type private and public sector positively impact the educational output in efficiency and equity. The Indonesian government introduced the Adiwijaya program to encourage knowledge creation and school awareness of nature (Krisnawati et al., 2015). The program embodies the environmental policy, environmental-based curriculum, participative activities, and environmental facilities management. In a nutshell, the school performance is valuable measured through Adiwijaya program availability.

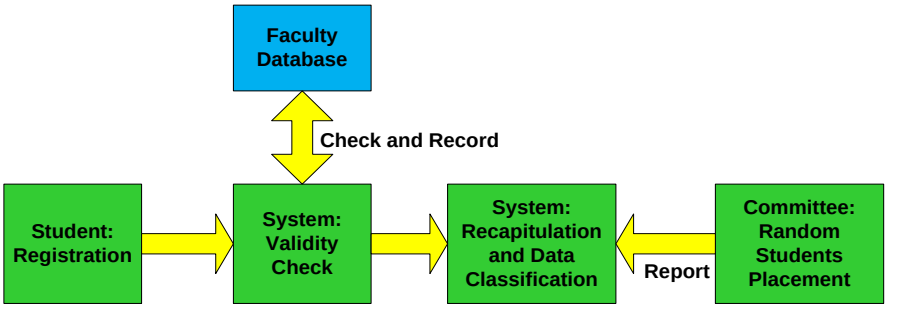


Figure 1. Flow Current Process Activities

Criteria Formulation

The formulation of criteria is defined in Tables 2 and 3. The weights of its priority are put in place following the summing up of focus group discussion. The discussion revealed the weighted of students' criteria as in Table 2, C1-The Value of Micro-teaching as the most priority criteria (30%) following by C2-Final GPA, C3-Program Study, C4- Credit Numbers, and C5- Student Address, respectively. The values of Max and Min for each criterion is referred by MOORA regulation for optimum and minimum values. The value of micro-teaching subsumes in grade A, A-, B+, B, B-, C+, and C with weight precedence into score 4, 3.70, 3.30, 3, 2.70, 2.30, and 2 respectively. The final GPA is specified as more than equal to 2.75. Program study is covered into seven programs, viz., Chemistry Education (P1), Economic Education (P2), English Language Education (P3), Mathematics Education (P4),

Counseling Education (P5), Islamic Religious Education (P6), and Arabic Language Education (P7) with the weight emphasis from seven to one accordingly. Credit numbers are designated not less than 120 credits. Criteria for student address encompasses the distance from school 0 to 500 meter, 500 to 2000 meter, and more than 2000 meter. The weights are generated into the value of three, two, and one, respectively.

Table 3 explained the weight of school criteria whereby C1-School Accreditation is denoted as the weightiest priority criteria at 30%. It is then pursued by C2-School Level, C3-School Type, C4-School Facilities (Wifi), C5-School Facilities (labour), C6-School Facilities (Library), C7-School Facilities (Air Conditioner), and C8-School Performance (Adiwiyata), respectively. The school's accreditation (C1) is measured in grades A and B thus, the weights in each case are specified in subject values of four and three. The school-level (C2) criteria contain the sub level in senior high school (TS1), Islamic senior high school (TS2), vocational high school (TS3), junior high school (TS4), an Islamic junior high school (TS5) with the circumscribed weight from five to one respectively. The school type (C3) is explained in public and private schools by considering the weighted priority in two public and private schools. Concurrently, the school facilities (C4-C7) and performance (C8) are determined by their availability, one weighted for provided, and zero for the rest.

MOORA Analysis

Following Equation (2.1), Tables 4 for forty (A1 to A40) students' matrix formation against the values of each criterion (C1 to C5) are elucidated. Subsequently, Equation (2.2) calculation for students' normalization matrix is spelt out as in Table 5. Table 6 is then declared according to the MOORA estimation in Equation (2.3) to denote the students' weighted matrix's normalization across criteria. Besides, Table 7 indicates the value of student's preference conforming to the Equation (2.4). Thus, it ranks the students from the highest score of *Yi* at student-A6 (0.1468), student-A25 (0.1466), student-A27(0.1462), student-A28 (0.1461), student-A20 (0.1455), student-A22 (0.1452), etc. Furthermore, a similar calculation from Equation (2.1) to (2.4) is applied to the side of the school perspective. As a final result, Table 8 shows the schools' place appertaining to the values of *Yi* where school-A4 as the highest score at 0.2713, following by school-A3 (0.2610), school-A2 (0.2474), school-A1

(0.2372), school-A8 (0.2067), school-A6 (0.1998), school-A10 (0.1986), school-A5 (0.1833), school-A7 (0.1759), and school-A9 (0.1728) accordingly.

Table 2

Weight of Student Criteria

No.	Criteria	Weight	Value
C1	The Value of Micro-teaching	30%	Max
C2	Final GPA	25%	Max
C3	Program Study	20%	Max
C4	Credit Numbers	15%	Max
C5	Student Address	10%	Min

Table 3

Weight of School Criteria

No.	Criteria	Weight	Value
C1	School Accreditation	30%	Max
C2	School Level	25%	Max
C3	School Type	15%	Max
C4	School Facilities (Wifi)	5%	Max
C5	School Facilities (labor)	5%	Max
C6	School Facilities (Library)	5%	Max
C7	School Facilities (Air Conditioner)	5%	Min
C8	School Performance (Adiwiyata)	10%	Min

Table 4

Student Matrix Formation

A	C_1	C_2	C_3	C_4	C_5
A_1	3.3	3.50	5	136	3
A_2	3.3	3.17	5	132	1
A_3	2.7	3.36	5	136	2
A_4	3.3	3.37	5	136	3
A_5	4	3.30	5	136	2
....	....	....	....	....	....
A_{36}	3	3.18	3	132	1
A_{37}	3.3	3.55	3	132	3
A_{38}	2.7	3.73	3	134	1
A_{39}	4	3.49	3	132	2
A_{39}	4	3.49	3	132	2
A_{40}	2	3.26	3	134	3
$\sum C_n$	20.2776	21.4116	28.5482	833.9017	13.8203

Table 5

Student Normalization Matrix

A	C_1	C_2	C_3	C_4	C_5
A_1	0.1627	0.1635	0.1751	0.1631	0.2171
A_2	0.1627	0.1481	0.1751	0.1583	0.0724
A_3	0.1332	0.1569	0.1751	0.1631	0.1447
A_4	0.1627	0.1574	0.1751	0.1631	0.2171
A_5	0.1973	0.1541	0.1751	0.1631	0.1447
....	....	....	....	....	....
A_{36}	0.1479	0.1485	0.1051	0.1583	0.0724
A_{37}	0.1627	0.1658	0.1051	0.1583	0.2171
A_{38}	0.1332	0.1742	0.1051	0.1607	0.0724
A_{39}	0.1973	0.1630	0.1051	0.1583	0.1447
A_{40}	0.0986	0.1523	0.1051	0.1607	0.2171

Table 6

Students Normalization Weighted Matrix

A	C_1	C_2	C_3	C_4	C_5
A_1	0.0488	0.0409	0.0350	0.0245	0.0217
A_2	0.0488	0.0370	0.0350	0.0237	0.0072
A_3	0.0399	0.0392	0.0350	0.0245	0.0145
A_4	0.0488	0.0393	0.0350	0.0245	0.0217
A_5	0.0592	0.0385	0.0350	0.0245	0.0145
....	....	....	....	....	....
A_{36}	0.0592	0.0333	0.0280	0.0212	0.0145
A_{37}	0.0444	0.0371	0.0210	0.0237	0.0072
A_{38}	0.0488	0.0414	0.0210	0.0237	0.0217
A_{39}	0.0399	0.0436	0.0210	0.0241	0.0072
A_{40}	0.0592	0.0407	0.0210	0.0237	0.0145

Table 7

Student Preference Value

A	Max(C_1+C_2+C_3+C_4)	Min(C_5)	Yi = Max - Min
A_1	0.1492	0.0217	0.1275
A_2	0.1446	0.0072	0.1374
A_3	0.1387	0.0145	0.1242
A_4	0.1477	0.0217	0.1260
A_5	0.1572	0.0145	0.1427
A_6	0.1540	0.0072	0.1468
....	....	....	....
A_{36}	0.1263	0.0072	0.1190
A_{37}	0.1350	0.0217	0.1133
A_{38}	0.1286	0.0072	0.1214
A_{39}	0.1447	0.0145	0.1302
A_{40}	0.1128	0.0217	0.0911

Table 8

School Preference Value

A	Yi	C_1	C_2	C_3	C_4	….	C_8
A_4	0.2713	4	5	2	1	….	1
A_3	0.2610	4	5	1	0	….	0
A_2	0.2474	4	4	2	1	….	1
A_1	0.2372	4	4	1	0	….	0
A_8	0.2067	3	3	1	0	….	0
A_6	0.1998	4	2	2	1	….	1
A_{10}	0.1986	4	3	2	0	….	1
A_5	0.1833	4	1	1	0	….	0
A_7	0.1759	4	1	2	1	….	1
A_9	0.1728	4	2	1	0	….	0

Rule-Based Application

Rule-based construction was carried out by considering the variables of the study program (C3) from the students' perspective and school level (C2) from the school's perspective. Decision Tree Diagram can be depicted in Figure 2.

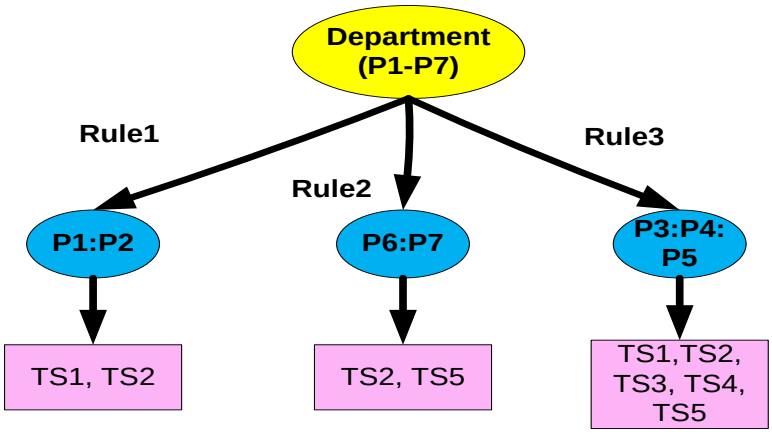


Figure 2. Decision tree diagram for FEP rule-based

Rule-based development is presented as follows:

Rule 1: IF [P1] OR [P2] THEN [TS1, TS2]

Rule 2: IF [P6] OR [P7] THEN [TS2, TS5]

Rule 3: IF [P3] OR [P4] OR [P5] then [TS1, TS2, TS3, TS4, TS5].

In a nutshell, the selected students at the side of committee perspectives are merged with the preferred schools from the school perspective. Thus, it is pursuing the rule-based formula as above (Rule 1 to 3). As a result, eight groups recommendation are then suggested as in Figure 3. Figure 3 elucidated that group one's recommendation is revealed from the first five rank students (A6, A25, A27, A28, A20) to be placed in the first three order schools (A4, A3, A2). The recommendation group two puts the sixth position students (A22, A24, A26, A5, A2) into school-A3, school-A2, school-A1, and reciprocally. For the detailed integration of MOORA and rule-based in eight groups, the recommendation is interpreted in Table 9.

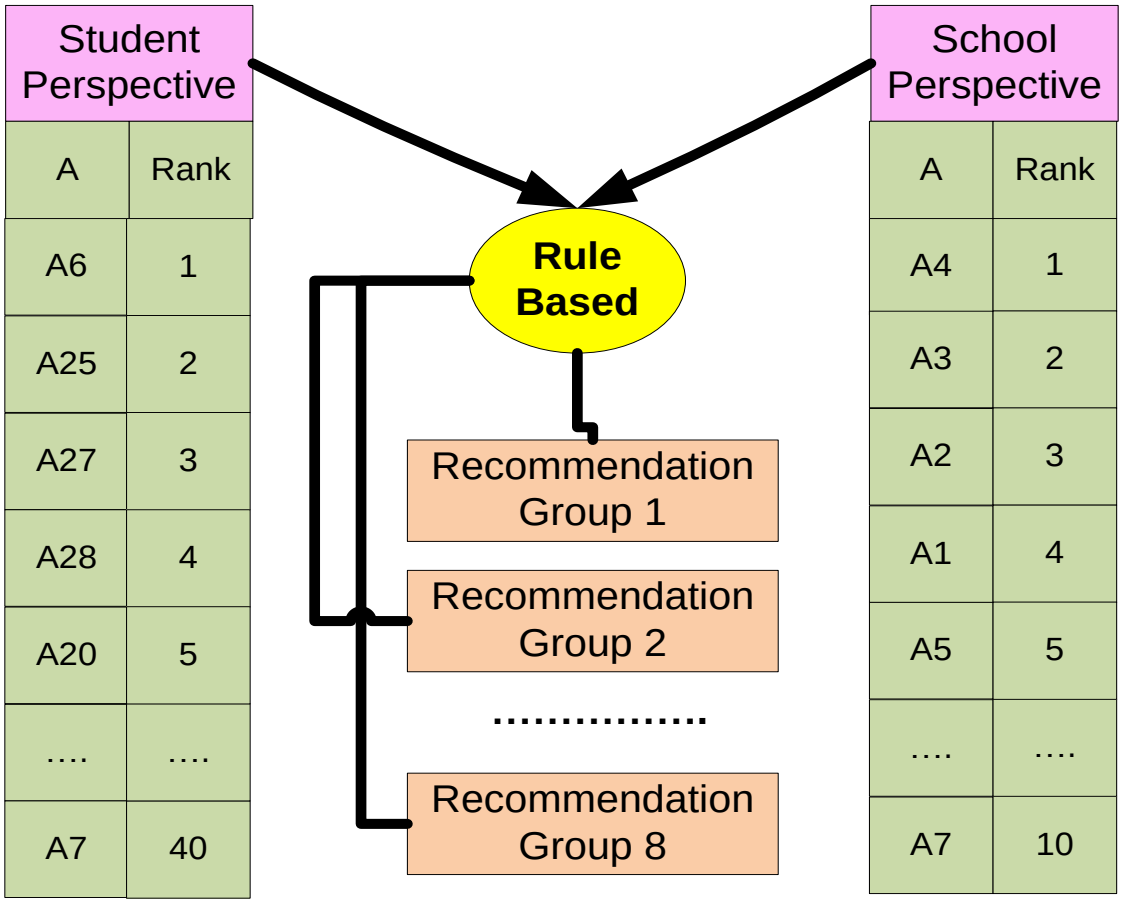


Figure 2. Integration of MOORA and Rule-based

Table 9

FEP Student Placement Recommendation

Recommendation Group 1					
Alternatives (Student) by Rank		Department	Alternatives (School) by Rank		School Level
A_6	1	P3	A_4	1	TS1
A_{25}	2	P1	A_3	2	TS1
A_{27}	3	P1	A_2	3	TS2
A_{28}	4	P1			
A_{20}	5	P2			
Recommendation Group 2					
A_{22}	6	P2	A_3	2	TS1
A_{24}	7	P2	A_2	3	TS2
A_{26}	8	P1	A_1	4	TS2
A_5	9	P7			
A_2	10	P7			
Recommendation Group 3					
A_{30}	11	P1	A_2	3	TS2
A_{21}	12	P2	A_1	4	TS2
A_{32}	13	P4	A_5	5	TS3
A_{14}	14	P6			
A_{39}	15	P5			
...	...	...	...	...	...
Recommendation Group 8					
A_{11}	36	P7	A_9	8	TS5
A_{10}	37	P7	A_{10}	9	TS5
A_{40}	38	P5	A_7	10	TS4

A_{13}	39	P6
A_7	40	P7

System Development

A prototype of MOORA-Rulebased-DSS system as a management information system is designed and developed to automate the procedure of FEP, starting from the registration, management data of students and schools, management data of criteria and alternatives provided, management stakeholders internal and external as users, and integrated MOORA and Rule-based calculation procedures. The MOORA-Rulebased-DSS system architecture can be seen in Figure 4. Two key figures, namely the FEP committee and administrator, have engaged in this application to date. The administrator has access to the whole process of knowledge-based. In the meantime, the committee received the recommendations suggested by the application.

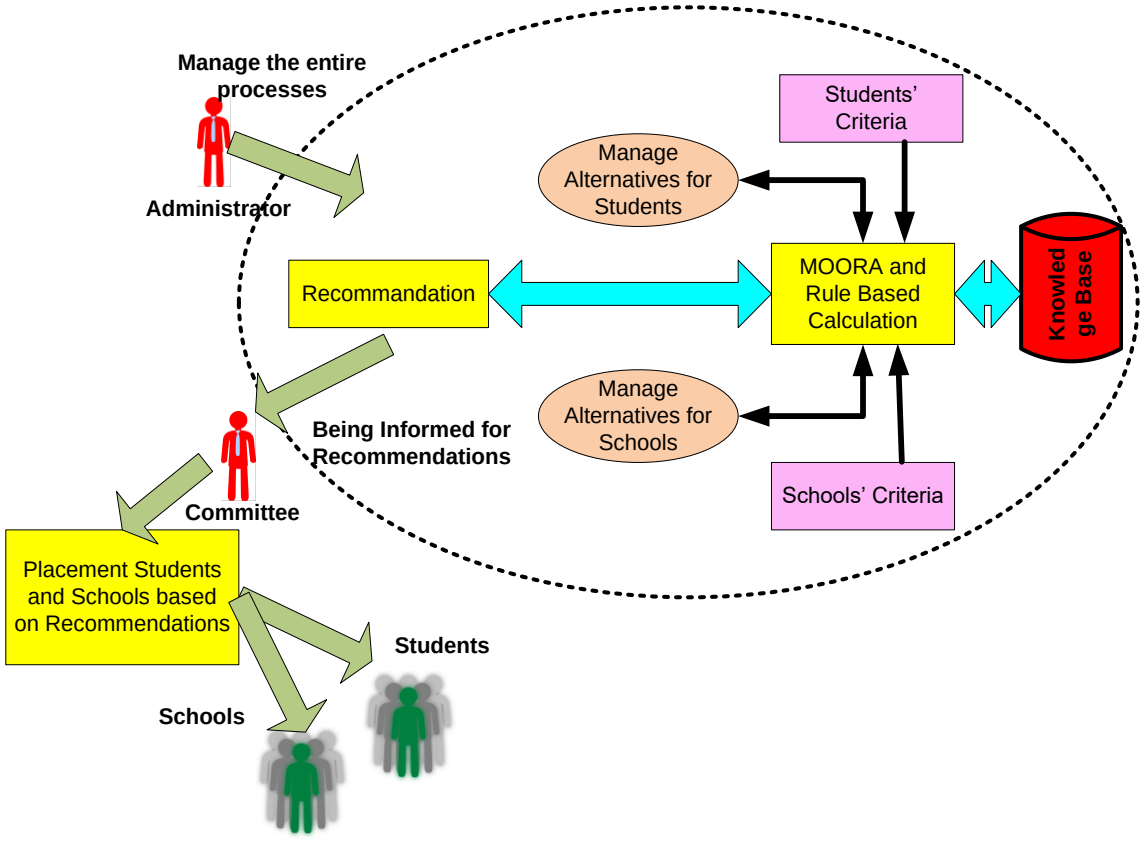


Figure 4. System Architecture of MOORA-Rulebased-DSS

Testing

To evaluate the MOORA-Rulebased-DSS, a UAT assessment's survey of twenty respondents came from five of the committees, eight study program leaders, two management schools, and five management faculty. The respondents are asked their perceives on the acceptance of MOORA-Rulebased-DSS application by considering the interactive design of system interface (5 questions), the easy use of DSS system (5 questions), the system utilization in aiding management decision making (5 questions), and the agreement on the proposed DSS system recommendation (5 questions). As a result, it obtained a very agreeable response of 86.92% covenant. Subsequently, Blackbox testing is conveyed into several DSS system functions, including login, user updated data, students updated data alternatives, schools updated data alternative, MOORA execution, Rule-based execution, and MOORA-Rulebased execution process. The testing revealed that 100% functionality and codifying test following the requirements analysis phase and user expectations. A Confusion Matrix is then generated by referring to Equation 2.5 and 2.6. As a result, the Confusion Matrix achieved an accuracy value of 78.33% from 94 data tests with status "True" and 21.67% error rate from 26 data sets with conditional status "False". The calculation shows that this recommendation system succeeded in providing the most optimal advice in students' placement in the FEP.

CONCLUSION

This research has prevailed in propounding the optimal students' placement in the FEP. The multiple perspectives based on committee and schools have been accommodated by considering criteria and the adherence of MOORA calculation and rule-based. The inclusion of rule-based has been successfully intensified the role of MOORA in optimizing the decisions. This recommendation system puts forward eight group suggestions as alternatives in placing the students for the FEP. The evaluation reveals the stakeholders' satisfaction and acceptance of the procedures and alternatives proposed. Hence, the emerging obstacles during the FEP can be minimized, and the stakeholders' amusement will be increased. Besides, the advancement of traineeship procedure and the suggested solution's objectivity impact the committee's performance towards the optimal, effective, and efficient services, especially in decision-making. Due to the constraints of user capabilities and knowledge from the committee, students, and schools' side on DSS system operation, the administration's role is playing significant values in managing the knowledge-based and data modelling. Therefore, future

studies are encouraged to design the dynamic and smart DSS system. Therefore, all stakeholders will be directly involved and manage the knowledge based on the criteria and alternatives provided. Consequently, the efficiency of rule-based in complex environment tracking will linearly increase and powerful. Besides, the smart DSS system can accommodate more valuable perspectives.

ACKNOWLEDGEMENT

The authors fully acknowledged Faculty Science and Technology and Faculty Education and Teacher Training Universitas Islam Negeri Sultan Syarif Kasim Riau for data collection. It makes a high contribution to this research to be more viable and effective.

REFERENCES

Akram, M., Ilyas, F., & Garg, H. (2019). Multi-criteria group decision making based on ELECTRE-I method on Pythagorean fuzzy information. *Soft Computing*, *24*(5), 3425–3453.

Arabsheybani, A., Paydar, M. M., & Safaei, A. S. (2018). An integrated fuzzy MOORA method and FMEA technique for sustainable supplier selection considering quantity discounts and supplier's risk. *Journal of Cleaner Production*, *190*, 577–591.

Ardana, I. M., Ariawan, I. P. W., & Divayana, D. G. H. (2016). Development of decision support system to slection of the blended learning platforms for mathematics and ICT learning at SMK TI Udayana. *International Journal of Advanced Research in Artificial Intelligence*, *5*(12), 15–18.

Bonjar, H. S., Salajegheh, S., Pourkiani, M., & Sayadi, S. (2019). Identifying the dimensions and sustainable supply chain operations for knowledge-based decision making in Iran's tax affairs organization. *International Journal of Supply Chain Management*, *8*(2), 735–743.

Brauers, W. K. M. (2008). Multi-objective contractor's ranking by applying the Moora method. *Journal of Business Economics and Management*, *9*(4), 245–255.

Brauers, W.K.M., & Zavadskas, E.K. (2006). The Moora method and its application to privatization in a transition economy. *Control and Cybernetics, Systems Research Institute of the Polish Academy of Sciences, 35*(2), 445-469.

Büyüközkan, G., & Güler, M. (2020). Smart Watch Evaluation with Integrated Hesitant Fuzzy Linguistic SAW-ARAS Technique. *Measurement, 153* (March 2020), 107353.

Carneiro, J., Alves, P., Marreiros, G., & Novais, P. (2020). Group decision support systems for current times: Overcoming the challenges of dispersed group decision-making. *Neurocomputing, 423*, 735-746.

Chakraborty, S. (2011). Applications of the Moora method for decision making in manufacturing environment. *International Journal of Advanced Manufacturing Technology*, *54*(9–12), 1155–1166.

Chan, C. K., & Yeung, N. C. J. (2019). Students' approach to develop in holistic competency: an adaption of the 3P model. An *International Journal of Experimental Educational Psychology, 40*(5), 1-21.

Cherchye, L., De Witte, K., Ooghe, E., & Nicaise, I. (2010). Efficiency and equity in private and public education: A nonparametric comparison. *European Journal of Operational Research, 202*, 563–573.

Conejero, J. M., Preciado, J. C., Prieto, A. E., Bas, M. C., & Bolós, V. J. (2020). Applying data driven decision making to rank vocational and educational training programs with TOPSIS. *Decision Support Systems*, 113470.

Copeland, L. (2004). *A practitioner's guide to software test design*. Boston, London: Artech House.

Dabbagh, R., & Yousefi, S. (2019). A hybrid decision-making approach based on FCM and MOORA for occupational health and safety risk analysis. *Journal of Safety Research, 71*, 111-123.

Davis, D. J., & Ringsted, C. (2006). Accreditation of undergraduate and graduate medical education: How do the standards contribute to quality? *Advances in Health Sciences Education, 11*(3), 305–313.

Davis, F. D., & Venkatesh, V. (2004). Toward pre prototype user acceptance testing of new information systems: Implications for software project management. *IEEE Transactions on Engineering Management*, *51*(1), 31–46.

De Farias Aires, R. F., & Ferreira, L. (2019). A new approach to avoid rank reversal cases in the TOPSIS method. *Computers & Industrial Engineering*, *132*, 84–97.

Delen, D., Topuz, K., & Eryarsoy, E. (2020). Development of a bayesian belief network-based DSS for predicting and understanding freshmen student attrition. *European Journal of Operational Research, 281*(3), 575-587.

Dinçer, H., Yüksel, S., & Martínez, L. (2019). Interval type 2-based hybrid fuzzy evaluation of financial services in E7 economies with DEMATEL-ANP and MOORA methods. *Applied Soft Computing, 79*, 186-202.

Du, Y., Zheng, Y., Wu, G., & Tang, Y. (2020). Decision-making method of heavy-duty machine tool remanufacturing based on AHP-entropy weight and extension theory. *Journal of Cleaner Production, 252*, 119607.

El-gayar, O. F., & Fritz, B. D. (2010). A web-based multi-perspective decision support system for information security planning. *Decision Support Systems*, 5*0*(1), 43–54.

Emovon, I., Okpako, O. S., & Edjokpa, E. (2020). Application of fuzzy MOORA method in the design and fabrication of an automated hammering machine. *World Journal of Engineering*. https://doi.org/10.1108/WJE-07-2020-0250. In Press.

Engel, M. M., Utomo, W. H., & Purnomo, H. D. (2017). Fuzzy multi attribute decision making – simple additive weighting (MADM - SAW) for information retrieval (IR) in e - commerce recommendation. *International Journal of Computer Science and Software Engineering*, *6*(6), 136–145.

Fei, L., Xia, J., Feng, Y., & Liu L. (2019). An Electre-based multiple criteria decision-making method for supplier selection using Dempster-Shafer theory. *IEEE Access, 7*, 84701-84716.

Fox, W. P., Ormond, B., & Williams, A. (2015). Ranking terrorist targets using a hybrid AHP–TOPSIS methodology. *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, *13*(1), 77–93.

Gadakh, V. S., Shinde, V. B., & Khemnar, N. S. (2013). Optimization of welding process parameters using MOORA method. *International Journal of Advanced Manufacturing Technology*, *69*(9–12), 2031–2039.

Gang, Z., Juanjo, M., & Carmen, J. (2020). Chinese student teachers' teaching practicum experiences: insights from transformative learning, third space, and dialogical-self theory. *International Journal of Educational Research, 103,* 101638.

Gràcia, M., Casanovas, J., Riba, C., Sancho, M. R., Jarque, M. J., Casanovas, J., & Vega, F. (2020). Developing a digital application (EVALOE-DSS) for the professional development of teachers aiming to improve their students' linguistic competence. *Computer Assisted Language Learning,* 1–26.

Gündoğdu, F. K., & Kahraman, C. (2019). A novel fuzzy TOPSIS method using emerging interval-valued spherical fuzzy sets. *Engineering Applications of Artificial Intelligence*, *85*, 307–23.

Han, J., Pei, J., & Kamber, M. (2011). *Data Mining Techniques, Third Edition*. United States of America: British Library.

Hemdi, M. A., Mohd, Salehuddin. MZ, & Hafiz, MH (2016). Integrated cumulative grade point avarage (iCGPA): concepts, challenges, and reality. *Proceedings of the Conference Heads of Academic Department (CHAD)*. ILD Nilai, Malaysia: UiTM.

Hsu, W.-C. J., Liou, J. J. H., & Lo, H.-W. (2020). A group decision-making approach for exploring trends in the development of the healthcare industry in Taiwan. *Decision Support Systems,* 113447.

Ibrahim, O., Sundgren, D., & Larsson, A. (2014). An integrated decision support system framework for strategic planning in higher education institutions, Proceedings *of Joint International Conference on Group Decision and Negotiation: Group Decision and Negotiation. A Process-Oriented View* (pp. 237–238). Toulouse, France.

Jones, A., Korson, S. J., Murray-Everett, N. C., Kessler, M. A., Harrison, D., Cronenberg, S.... & Parsons, M. J. (2020). Teacher candidate tensions with the edTPA: a neoliberal policy analysis, *The Educational Forum,* 1-19.

Julie, B., & Katie, Z. (2017). A good news story: early-career music teachers' accounts of their flourishing professional identities. *Teaching and Teacher Education, 68,* 241-251.

Kacprzak, D. (2019). A doubly extended TOPSIS method for group decision making based on ordered fuzzy numbers. *Expert System with Applications*, *116*, 243–254.

Kazemi, F., Bahrami, A., & Sharif, J. A. (2020). Mineral processing plant site selection using integrated fuzzy cognitive map and fuzzy analytical hierarchy process approach: A case study of gilsonite mines in Iran. *Minerals Engineering*, *147*, 106143.

Kilic, H. S., Demirci, A.E., & Delen, D. (2020). An integrated decision analysis methodology based on IF-DEMATEL and IF-ELECTRE for personnel selection. *Decision Support Syst*, *137*, 113360.

Krisnawati. Y., Irawati, M., Rochman, & F., Budiasih, E. (2015). The implementation of students' campaign program to form Adiwiyata school in Malang, Indonesia. *International Journal of Research Studies in Education*, *4*(4), 53-65.

Kumar, N., Singh T., Grewal, J. S., Patnaik, A., & Fekete, G. (2019). A Novel Hybrid AHP-SAW Approach for Optimal Selection of Natural Fiber Reinforced Non-Asbestos Organic Brake Friction Composites. *Materials Research Express, 6*(6), 065701.

Leny, N., & Okfalisa. (2019). Measuring the sustainability performance of Islamic banking in Indonesia, *Journal Social Science and Humanities*, *27*(2), 1073-1090.

Lewis, H. G., & Brown, M. (2001). A generalized confusion matrix for assessing area estimates from remotely sensed data. *International Journal of Remote Sensing*, *22*(16), 3223–3235.

Li, Z., et al. (2020). The development and realization of a multi-faceted system for green building planning: A case in Ningbo using the fuzzy analytical hierarchy process. *Energy & Buildings*, *226*, 110371.

Liang, D., & Xu Z. (2017). The new extension of TOPSIS method for multiple criteria decisions making with hesitant Pythagorean fuzzy sets. *Applied Soft Computing*, *60*, 167–179.

Liang, Z.-L., Yun, T.-J., Oh, W.-B., Lee, B.-R., & Kim, I.-S. (2020). A study on MOORA-based Taguchi method for optimization in automated GMA welding process. *Materials Today: Proceedings, 22*, 1778–1785.

Liao, H. C., Wu, X., Mi, X., & Herrera, F. (2020). An integrated method for cognitive complex multiple experts' multiple criteria decisions making based on ELECTRE III with weighted Borda rule. *Omega, 93(C)*, 102052.

Liu, D., & Stewart, T. J. (2004). Object-oriented decision support system modelling for multicriteria decision making in natural resource management. *Computers & Operations Research, 31*(7), 985–999.

Madić, M., Radovanović, M., & Petković, D. (2015). Non-conventional machining processes selection using multi-objective optimization on the basis of ratio analysis method. *Journal of Engineering Science and Technology, 10*(11), 1441–1452.

Mangla, S. K., Govindan, K., & Luthra, S. (2017). Prioritizing the barriers to achieve sustainable consumption and production trends in supply chains using fuzzy Analytical Hierarchy Process. *Journal of Cleaner Production, 151*, 509-525.

Martusorn, K. H., Chattrarat, K. B., & Shaharudin, M.R. (2019). Comparative analysis of multiple criteria decision making (MCDM) approach in warehouse location selection of agricultural products in Thailand. *International Journal of Supply Chain Management, 8*(5), 168-175.

Memari, A., Dargi, A., Jokar, M.R.A., Ahmad, R., & Rahim, A.R.A. (2019). Sustainable supplier selection: A multi-criteria intuitionistic fuzzy TOPSIS method. *Journal of Manufacturing Systems, 50*, 9–24.

Mishra, A. R., Singh, R.K, & Motwani, D. (2020). Intuitionistic fuzzy divergence measure-based ELECTRE method for performance of cellular mobile telephone service providers. *Neural Computing and Applications, 32*, 3901-3921.

Mistarihi, M. Z., Okour, R. A., & Mumani, A. A. (2020). An integration of a QFD model with Fuzzy-ANP approach for determining the importance weights for engineering characteristics of the proposed wheelchair design. *Applied Soft Computing Journal, 90*, 106136.

Mukodimah, S., et al. (2018). Fuzzy Simple Additive Weighting and its Application to Toddler Healthy Food. *International Journal of Pure and Applied Mathematics, 118*(7), 1–7.

Nidhra, S. (2012). Black Box and White Box Testing Techniques - A Literature Review. *International Journal of Embedded Systems and Applications, 2*(2), 29–50.

Okfalisa, Anugrah, S., Anggraini, W., Absor, M., Fauzi, SSM, & Saktioto, S. (2018). Integrated analytical hierarchy process and objective matrix in Balanced Scorecard dashboard

model for performance measurement. *Telecommunication Computer. Electron. Control, 16*(6), 2703-2711.

Okfalisa, O., Hidayati, R., Dwi, U.I., Pranggono, B., Elin, H., & Saktioto, S. (2021). Decision support system for smartphone recommendation: the comparison of Fuzzy AHP and Fuzzy ANP in multi-attribute decision making. *Journal SINERGI, 25*(1), 101-110.

Okfalisa, Zulfahri, Dwi, U. I., Megawati, & Saktioto (2020). Online shop recommendations: decision support system based on multi objective optimization on the basis of ratio analysis. *Proceeding in 8th International Conference on Cyber and IT Service Management (CITSM)* (pp. 1-6). Pangkal Pinang, Indonesia: IEEE.

Omrani, H., Alizadeh, A., & Amini, M. (2019). A new approach based on BWM and MULTIMOORA methods for calculating semi-human development index: An application for provinces of Iran. *Socio-Economic Planning Sciences, 70(C),* 100689.

Pardiyono, R., & Indrayani, R. (2019). Decision support system to choose private higher education based on marketing mix model criteria in Indonesia. *Proceedings of Tarumanagara International Conference on the Applications of Technology and Engineering* (pp. 1–6), Jakarta, Indonesia.

Patnaik, P. K., Swain, P. T. R., Mishra, S. K., Purohit, A., & Biswas, S. (2020). Composite material selection for structural applications based on AHP-MOORA approach. *Materials Today: Proceedings, 33*(8), 5659-5663.

Petkov, D., Petkova, O., Andrew, T., & Nepal, T. (2007). Mixing multiple criteria decisions making with soft systems thinking techniques for decision support in complex situations. *Decision Support Systems*, *43*(4), 1615–1629.

Pressman, R., & Maxim, B. (2020). Software Engineering: Practitioner's Approach, 9th Edition, New York: McGraw-Hill.

Roszkowska, E., Kacprzak, D. (2016). The fuzzy SAW and fuzzy TOPSIS procedures based on ordered fuzzy numbers. *Information Science, 369,* 564–584.

Saban, A., & Coklar, A. N. (2013). Pre-service teachers' opinions about the micro-teaching. *The Turkish Online Journal of Educational Technology*, *12*(2), 234–240.

Selvi, K. (2010). Teachers' Competencies. *Cultura. International Journal of Philosophy of Culture and Axiology*, *7*(1), 167–176.

Shihab, S. K., Khan, N. Z., Myla, P., Upadhyay, S., Khan, Z. A., & Siddiquee, A. N. (2018). Application of MOORA method for multi optimization of GMAW process parameters in stain-less steel cladding. *Management Science Letters, 8*(4), 241–246.

Stanujkic, D., Magdalinovic, N., Stojanovic, S., & Jovanovic, R. (2012). Extension of ratio system part of MOORA method for solving decision-making problems with interval data. *Informatica, 23*(1), 141–154.

Sztubecka, M., Skiba, M., Mrówczyńska, M., & Bazan-Krzywoszańska, A. (2020). An Innovative Decision Support System to Improve the Energy Efficiency of Buildings in Urban Areas. *Remote Sensing, 12*(2), 259.

Yazdani, M., Zarate, P., Coulibaly, A., & Zavadskas, E. K. (2017). A group decision making support system in logistics and supply chain management. *Expert Systems with Applications, 88*, 376–392.

Yeo, L. S., Ang, R. P., Chong, W. H., Huan, V. S., & Quek, C. L. (2008). Teacher efficacy in the context of teaching low achieving students. *Current Psychology*, *27*(3), 192–204.

You, Y., Sun, J., Jiang, J., & Tan, Y. (2019). Belief-rule-base model with attribute reliability for multiple attribute decision making. *Proceedings of Chinese Control and Decision Conference (CCDC)* (pp. 4770–4775). Nanchang, China: IEEE.

Yusuf, T. I. (2019). A multi-objective credit evaluation model using MOORA method and goal programming. *Arabian Journal of Science and Engineering, 45*, 2035-2048.

Zendarski, N., Haebich, K., Bhide, S., Quek, J., Nicholson, J. M., Jacobs, K. E., Efrom, D., & Sciberras, E. (2020). Student-teacher relationship quality in children with and without ADHD: a cross-sectional community-based study. *Early Childhood Research Quarterly, 51*, 275-284.