

# Adopting Design and Development Research (DDR) Approach in Framing the ESL Preservice Teachers' Roles and Responsibilities to Teach Writing Skills

Mohd Amir Izuddin Mohamad Ghazali<sup>1</sup>, Zuraina Ali<sup>2</sup>, Azwin Arif Abdul Rahim<sup>3</sup>

<sup>1</sup>Faculty of Arts and Social Sciences, Universiti Tunku Abdul Rahman, 31900 Kampar, Perak, Malaysia

<sup>2,3</sup>Centre for Modern Languages, Universiti Malaysia Pahang, 26600 Pekan, Pahang, Malaysia

Email: izuddin@utar.edu.my

DOI: 10.47750/pnr.2022.13.S06.098

## Abstract

This For English as Second Language (ESL) preservice teachers (PSTs), practicum has a pivotal role in their teacher training program. Evidence suggests that practicum is among the important components of assessments for ESL PSTs. During the practicum stint, they will encounter a series of challenges which include anxiety, low teaching performance, and lack of experience and skill to teach. One of the concerns is that they do not have clear understanding of their roles and responsibilities to teach the four language skills namely speaking, listening, reading, and writing skills. In relation to the writing skills, a growing body of literature recognized that it is one of the most challenging skills to be taught to the second language (L2) students. Combining the lack of understanding on roles and responsibilities to teach and the challenging aspect of teaching writing skills, this can affect the PSTs teaching performance. Due to that, this paper proposes to adopt Design and Development Research (DDR) approach to develop a framework of ESL PSTs' roles and responsibilities to teach writing skills. Following the DDR steps, there are three phases to be carried out which include needs analysis in the first phase, followed by the design and development of framework, and finally, the evaluation of the framework. Each phase will utilize and employ different type of participants, procedures, and analysis. Altogether, the framework is hoped to benefit the ESL PSTs' teaching performance when conducting writing instruction during their practicum stint in schools.

**Keywords:** Design and Development Research (DDR), Fuzzy Delphi Method (FDM), Modified Nominal Group Techniques (MNGT), Preservice teacher.

## I. INTRODUCTION

Practicum is fundamental in a preservice teachers' (PSTs) education [8] [26]. Throughout the duration of 15 to 16 weeks in school, they will put the theories, pedagogies, and methodologies into practice [45]. Commenting on that, [44] point out that PSTs have to be performing at their peak as they are being observed and assessed by the teacher mentor and supervising lecturer. In an investigation into the assessment of their practicum, [5] reports that practicum is multifaceted in nature, backed with institutional parameters yet highly individualized in practice such as the participation in the co-curriculum activity, professional relationship with the principal, teachers, and administrative staff, and most importantly, teaching-related matters such as lesson plan and instructional activity. The latter contributes the highest weightage as teaching is their main duty and it is crucial to ensure that PSTs are delivering high-quality education to the students.

Having said that, a substantial body of literature describes the challenges that PSTs encountered while completing their practicum. [10] suggest that the reason it happened is because practicum is their first and actual experience of being a teacher and believe that they have trouble navigating through it. Consequently, it causes them to feel anxious and affects their teaching performance. Other than that, they potentially have to deal with the second language (L2) students' behavior, learning style, learning needs, and level of English language proficiency. In Malaysia context, the general English language proficiency is still considerably low [28], particularly for writing skills [23]. In their review, [23] implicate that Malaysian students' writing performance in the national primary and secondary school examination remains low. It is even concerning when [47] found

that despite years of learning writing skills in schools, Malaysian students are still weak in writing. Not only the students, [21] mention that the teachers are facing challenges to teach writing skills. This can further add stress to the PSTs which corroborates with [15]'s analysis where they identify that when L2 students' proficiency is broken down into each language skills namely reading, writing, speaking, and listening skills, it could result to anxiety. To illustrate, some L2 students are advanced listeners but beginners for writing skill. PSTs would need to immediately assess each L2 student's level of competency to customize the lesson for each group of students.

From the PSTs' perspective, it is presumably that the lack of knowledge on what their roles and responsibilities in teaching writing skills lead to low teaching performance. They probably have a general idea on the role they need to play and what they need to do for the lesson. However, in writing skills, there are three (3) stages of teaching writing that PSTs need to deal with which are pre-writing, while-writing, and post-writing stage. As there are three (3) different stages of teaching writing, [6] recommend that PSTs should carry out different responsibilities for each stage. In essence, it is important that they have the knowledge and awareness of what and how to teach writing skill.

As suggested by [37], a teacher needs not only have content knowledge, but it is crucial for them to employ the right pedagogical and methodological approaches in teaching writing based on the students' needs and proficiency level. To ensure the PSTs are confident to conduct an effective writing instruction, it is believed that they need to have a clear understanding of their roles and responsibilities. Due to that, this study proposes Design and Development Research (DDR) Approach to be used in developing a framework of PSTs' roles and responsibilities for teaching writing skills.

## II. METHODOLOGY

The study proposes to employ the DDR [35] to develop the framework for the PSTs' roles and responsibilities to teach writing skills. It was introduced to test a theory and validate its practicality. Not limited to theory, [32] argued that it was also employed in designing and developing interventions like programs, instructional and learning strategies, products, and systems to solve difficult educational issues and learn more about the characteristics and processes of the interventions' design and development. Consequently, this has become a main reason for this study to employ DDR approach to accomplish the goal of designing and developing the PSTs' roles and responsibilities framework. This is consistent with [42] view that the method is flexible yet systematic which allows it to be employed to improve educational practices.

Employing DDR approach as the process guideline, this study will be conducted in three (3) phases which are (i) needs analysis, (ii) design and development, and (iii) evaluation.

### A. Phase 1: Needs Analysis

This phase focuses on the needs analysis in exploring the need for a framework to support the PST's training program. The finding of this phase contributes to the basis of developing the roles and responsibilities framework for the PST in teaching writing skills during practicum. The PSTs who have completed their practicum will be selected to participate. By employing semi-structured interview as the research instrument, the findings will be used to explore the following:

- 1) PSTs' experience when teaching writing skills during practicum
- 2) Roles that PSTs played during the teaching of writing skills.
- 3) Responsibilities that PSTs carried out during the teaching of writing skills.

The finding from Phase 1 will eventually produce a list of roles and responsibilities to teach writing skills from the PSTs' perspectives and which in turn, becomes one of the instruments for Phase 2.

## B. Phase 2: Development and Design

The second phase is where the intended framework is developed. From the list of roles and responsibilities gathered in Phase 1, they will then be selected by a panel of experts. This is to avoid biasness in determining the relationship among the PSTs roles and responsibilities. To achieve the group consensus, the fuzzy Delphi method (FDM) will be employed [22]. It is a combination between fuzzy set theory and Delphi technique. This method is one of the analytical methods for decision making which incorporates fuzzy theory in the traditional Delphi method. This theory works as an extension of classical set of theory where each element in the set is assessed based on the set of binaries i.e. Yes or No. [33] highlighted that the value of numbering fuzzy consist of 0 to 1 or in the unit interval (0,1). As for the Delphi method, [24] identified this method as a decision-making method as it involves several rounds of questionnaire survey to elicit the experts' views on an issue being investigated.

The participants for this phase will be a panel of experts. A correct selection of panel is vital as this phase relies heavily on their views [30] [38]. In addition, [1] highlighted that the selection of experts should be based on four (4) 'expertise' requirements which include (i) knowledge and experience with the issues under investigation, (ii) capacity and willingness to participate, (iii) sufficient time to participate in the study, and (iv) effective communication skills. Based on the suggestion, the selection of the participants is based on the following four (4) criteria:

- 1) Experts should at least possess master's degree in education with minimum 5 years of teaching experience in the subject matter
- 2) Experts should have knowledge in the area of practicum and preservice teachers.
- 3) Experts who are willing to participate in the study.
- 4) Experts should be able to provide feedback on the content of the framework.

Another important consideration is that the numbers of experts that is needed for the Fuzzy Delphi Method (FDM). [1] argue that it should be between 10 to 15 experts if there is a high level of consistency among experts. Contradictory, [20] suggest that for FDM, the number of experts should be between 10 to 50 experts. Due to that, it is proposed that the number of experts for this study would be between 12 to 15 experts.

In term of research instrument, two (2) instruments will be used. The first instrument is a draft of the pre-listed PSTs roles and responsibilities generated from the qualitative inquiry made in Phase 1. This list serves as a guide for the experts in this study to identify the appropriate PSTs roles and responsibilities to teach writing skills for the inclusion in the framework. Experts are allowed to reject or add other roles and responsibilities that they believe to be suitable to be included in the final list of the framework.

Secondly, a 7-scale evaluation survey questionnaire will be used in this phase. The questionnaire will be divided into two (2) sections namely demographic and expert's views of the framework. The first part consists of two (2) sections which are Section

A and Section B. Section A is to elicit expert's demographic background information while Section B is to prompt expert's involvement and familiarity with practicum and preservice teachers.

The procedure of data collection using FDM includes the following:

1. The selection of experts of to evaluate the model. This process of selection of experts has been elaborated in the previous section.
2. To address the fuzziness issue among the expert's views, a linguistic scale is determined to frame the expert's feedback. The linguistic scale is the same as Likert scale with an additional of fuzzy numbers given to the scale of responses based on the triangular fuzzy number. For each response, three (3) fuzzy values will be given to consider the fuzziness of the experts' views. The three (3) values consist three (3) levels of fuzzy value which are minimum value (m1), most plausible value (m2), and maximum value (m3). This means that the linguistic scale will be used to convert the linguistic variable into fuzzy numbers. The level of agreement scale should be in odd numbers (3, 5, or 7 point linguistic scale).
3. The experts' responses with the corresponded fuzzy number scales for each questionnaire item on the views of the model will inserted in a Microsoft Excel spreadsheet.
4. The next step is to calculate the difference between the experts' evaluation data and the average value for each item to identify the threshold value, 'd'.
5. Once the group consensus is achieved, the aggregate fuzzy evaluation is determined by adding all the fuzzy numbers for each item.
6. The final step of the procedure of the evaluation phase is call the defuzzification process.

In the general application of fuzzy Delphi, defuzzification is essential to classify the variables agreed by the consensus of the experts through ranking of the variables. The variable that has the high defuzzification value is to be ranked the highest in priority and to be considered as output variable.

The calculation of the defuzzification value and the rankings are to be used to identify which questionnaire items are agree upon in evaluating the framework for PSTs roles and responsibilities to teach writing skills. The range of defuzzification value that is accepted as reaching the consensus among the experts is between 33.6 to 46. The defuzzification value of 24 is the minimum value for experts' consensus under a hypothetical agreement of 'Moderately Agree' for all questionnaire items. The defuzzification value of 46.8 is the maximum value for indication of consensus experts' views under hypothetical agreement of 'Strongly Agree' for all questionnaire items. Fig 1 elaborates the range of agreement among the experts.

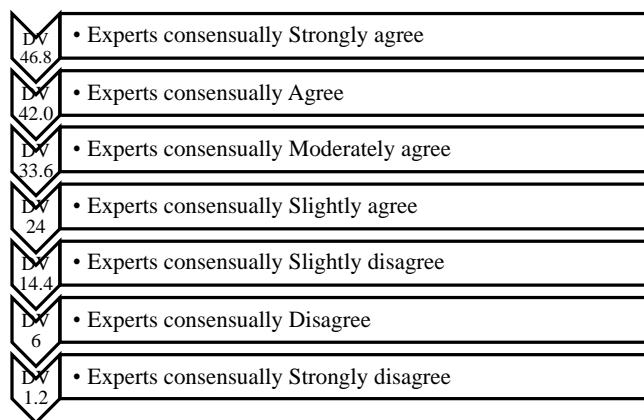


Fig. 1 Elaboration of experts' agreement based on defuzzification value

Hence, a defuzzification value less than 24 indicates the experts' consensus disagreement with the questionnaire item while a value ranging from 33.6 to 46.8 indicates consensus agreement among the experts.

The analysis of data from part one (1) of the questionnaire will be carried out using descriptive statistics via SPSS version 26 software. The study proposes the analysis of mode and means scores for this phase in order to chart the experts' background information of their expertise that is relevant to this study. Meanwhile, the data from part two (2) of the questionnaire will be analyzed using the FDM method following from step two (2) to six (6) as outlined in Fig 2 below.

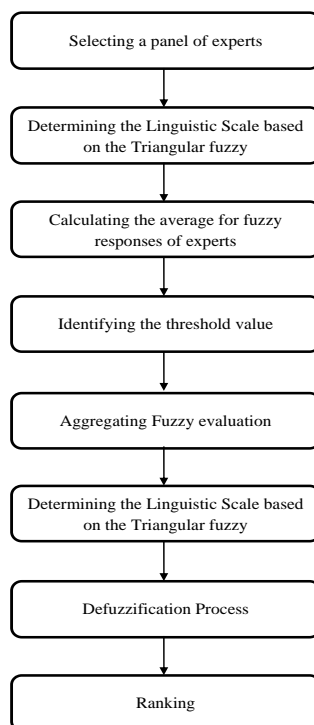


Fig 2 Flowchart of fuzzy Delphi Method Procedure

### C. Phase 3: Evaluation of Framework

The aim for this third phase is to evaluate the model. It is to validate whether the proposed framework of this study is suitable to be used as a guide for the PSTs to teach writing skills. The evaluation process will involve a panel of experts in which they will be looking at PSTs' roles and responsibilities as element of the framework, the relationship among the roles and responsibilities, and the suitability of this framework in terms of its elements and the relationships among the elements.

To evaluate the framework, the study adopts the Modified Nominal Group Technique (MNGT) to elicit the experts' views. This technique includes both qualitative and quantitative method [27]. According to [29], the process of data collection would start with "acceptance of the idea without assessment" (qualitative) and followed by the process of ranking or ordering the precedent ideas (quantitative). However, due its flexibility, the technique can be conducted using quantitative approach for the whole process. This is the new nominal group technique (NGT) which known as Modified NGT [31]

MNGT is chosen for as technique for data collection because of the following reasons [14]:

1. This technique can balance out the level of education and rank of the participants. Everyone is allowed to speak based on their experience and knowledge in the area of study.
2. This technique is implemented for specific issues within a group, face-to-face and it allows the participants to focus on the issue.
3. This technique has a step where the participants can write down their own idea without being criticized and interrupted by other participants.
4. Following that is a step to record all the ideas from the user.
5. This technique includes discussion phase where the aim is to avoid misunderstanding among participants in the study.

For Phase 3, the panel of experts will be selected using the purposive random sampling to evaluate the framework. Previous studies have addressed the importance of identifying the number of experts to be recruited. [3] and [13] suggest that the number of experts for NGT should be between five (5) to (10) people. [19] recommend an ideal team that makes up of six (6) to twelve (12) people. Meanwhile, [16] study involved 30 to 40 experts review and [43] included a total of 92 experts. Based on the recommendations from past literature, this study proposes to select 12 to 15 experts to evaluate the framework.

With regards to the selection of experts, the process will be based on certain characteristics that the research will outline. However, it is noteworthy to ensure that the experts have some background and/or experience in the related field of study, able to contribute their opinions to the needs of study, and willing to revise their initial judgement to reach consensus among experts [25]. Therefore, four (4) characteristics are listed as follows:

1. Experts should at least possess master's degree in education with minimum 5 years of teaching experience in the subject matter.

2. Experts should have knowledge in the area of practicum and preservice teachers.
3. Experts who are willing to participate in the study.
4. Experts should be able to provide feedback on the content of the framework.

The four (4) list of criteria will also be used for the purpose of validity and reliability of this technique. This is supported by [43] in which the authors highlight that the list of characteristics in selecting the panel of experts would enhance the validity and reliability of MNGT.

There are five (5) steps involved in Phase 3 in developing the interpretive framework for PSTs roles and responsibilities to teach writing skills. Firstly, the MNGT begins with a short survey of pre-listed PSTs roles and responsibilities to teach writing skills. This survey will offer a description of the scope of the outcome of the study and eventually guide the experts with a starting point. In response to the survey, the experts are allowed to agree or disagree with list of PSTs roles and responsibilities. On top of that, they can present any new idea that they deem fit to be included in framework. Next, each of the PST's roles and responsibilities will be presented, familiarized, and clarified to allow the experts to make appropriate judgment on whether to include the PSTs roles and responsibilities in the final list or not. Then, the final list will be given to the experts individually for them to vote for suitable PSTs roles and responsibilities by giving a ranking number for every element. The ranking that will be used is in the scale of one (1) to seven (7) where one (1) indicates the least favorite and seven (7) indicates the most favorable item. Following is the interpretation of the scale:

1 = Least favorable

2 = Slightly favorable

3 = Moderately favorable

4 = Favorable

5 = Very favorable

6 = Highly favorable

7= Most favorable

This ranking number that is given by the experts will be accumulated to give the priority values for the PSTs roles and responsibilities. Finally, the PSTs roles and responsibilities are to be prioritized based on the total ranking number. Roles and responsibilities with the highest number shall be the most prioritized PSTs roles and responsibilities to teach writing skills. The flow chart for the MNGT session is as illustrated in Fig 3.

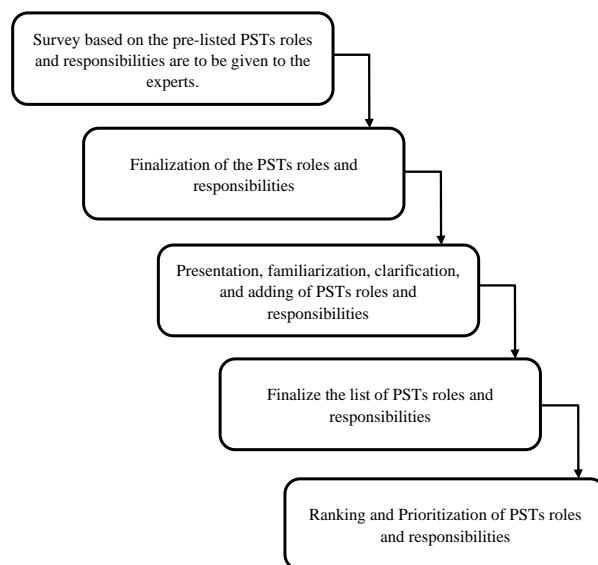


Fig 3 Flowchart of Modified Group Technique Session

Overall, Table 1 exemplifies the DDR proposed steps adapted into the process of framing the PSTs' roles and responsibilities to teach writing skills.

Table 1 Summary of DDR Proposed Steps

	<b>Phase 1</b>	<b>Phase 2</b>	<b>Phase 3</b>
<b>Purpose</b>	To inquire PSTs' perceptions of the roles and responsibilities when teaching writing skills during practicum. Also, this is to examine their acceptance level and intention to use the framework.	To select the PSTs' roles and responsibilities in teaching writing skills which will be carried out by the experts. Concurrently, the selected roles and responsibilities will be used in developing a framework.	To validate whether the proposed framework of this study is suitable to be used as guide for the PSTs to teach writing skills
<b>Data Collection</b>	Focus group interview	fuzzy Delphi Method (FDM)	Modified Group Technique (MNGT)
<b>Sample of the study</b>	15-20 preservice teachers	12-15 expert panels with predetermined characteristics.	12-15 expert panels with predetermined characteristics.
<b>Research Instrument</b>	Semi-structured interview	Draft of the pre-listed PSTs roles and responsibilities generated from the qualitative inquiry made in Phase 1  7-scale evaluation survey questionnaire	Survey form  Ranking and voting of the PSTs roles and responsibilities.



## CONCLUSION

This paper has described an effort in designing and developing a framework of PSTs' roles and responsibilities using the Design and Development Research (DDR) approach. The outcome of this project is hoped to be helpful and provide benefit to the PSTs in improving their teaching performance during practicum.

## REFERENCES

1. Adler, M., & Ziglio, E. (1996). *Gazing Into the Oracle: The Delphi Method and Its Application to Social Policy and Public Health*. Jessica Kingsley Publishers.
2. Azzat, M. N. (2006). *Pengantar Pengurusan*. Utusan Publications.
3. Allen, J., Dyas, J., & Jones, M. (2004). Building consensus in health care: a guide to using the nominal group technique. *British Journal of Community Nursing*, 9(3), 110–114. <https://doi.org/10.12968/bjcn.2004.9.3.12432>
4. Ariffin, A., Hashim, A. T., Siraj, S., & Razalli, A. R. (2019). Fuzzy Delphi Method (FDM): Evaluation on Consensus of Usability for Model of Activities Using Traditional Malay Children's Song for Enhancement of Creative- Imagination among Preschoolers. *International Journal of Advanced Science and Technology*, 28(8s), 149–157.
5. Aspden, K. M. (2017). The complexity of practicum assessment in teacher education: An examination of four New Zealand case studies. *Australian Journal of Teacher Education*, 42(12), 128–143. <https://doi.org/10.14221/ajte.2017v42n12.8>
6. Bradford Research School. (2018). *The 7 Stages of the Writing Process* | Bradford Research School. <https://researchschool.org.uk/bradford/news/the-7-stages-of-the-writing-process>
7. Bray-Clark, N., & Bates, R. (2003). Self-efficacy beliefs and teacher effectiveness: Implications for professional development. *The Professional Educator*, XXVI (1), 13–22. <http://www.theprofessionaleducator.org/articles/archives/fall2003.pdf#page=17>
8. Castañeda-Trujillo, J. E., & Aguirre-Hernández, A. J. (2018). Pre-Service English Teachers' Voices About the Teaching Practicum. *HOW*, 25(1), 156–173. <https://doi.org/10.19183/how.25.1.420>
9. Chang, P. T., Huang, L. C., & Lin, H. J. (2000). The fuzzy Delphi method via fuzzy statistics and membership function fitting and an application to the Human Resource. *Fuzzy Sets and Systems*, 112(3), 511–520.
10. Charisma, D., & Nurmalsari, P. (2020). An Investigation of Student Teachers' Anxiety Related to the Teaching Practicum. *ELLITE: Journal of English Language, Literature, and Teaching*, 5(1), 15–20. <https://doi.org/10.32528/ellite.v5i1.3205>
11. Cheng, C.-H., & Lin, Y. (2002). Evaluating the best main battle tank using fuzzy decision theory. *European Journal of Operational Research*, 142, 174–186.
12. Dalkey, N., & Helmer, O. (1963). An experimental application of Delphi method to use of experts. In *Management Science* (Vol. 9, pp. 458–467).
13. Delbecq, A. L., Van de Ven, A. H., & Gustafson, D. H. (2004). *Group Techniques for Program Planning: A Guide to Nominal Groups and Delphi Process*. University of Minnesota. <https://sites.google.com/a/umn.edu/avandeven/publications/books/group-techniques-for-program-planning>
14. Delp, P., Thesen, A., Motiwalla, J., & Seshardi, N. (1977). *Systems tools for project planning*. International Development Institute.
15. Deng, L., Zhu, G., Li, G., Xu, Z., Rutter, A., & Rivera, H. (2018). Student Teachers' Emotions, Dilemmas, and Professional Identity Formation Amid the Teaching Practicums. *Asia-Pacific Education Researcher*, 27(6), 441–453. <https://doi.org/10.1007/s40299-018-0404-3>
16. Dobbie, A., Rhodes, M., Tysinger, J. W., & Freeman, J. (2004). Using a modified nominal group technique as a curriculum evaluation tool. *Family Medicine*, 36(6), 402–406.
17. Duffield, C. (1993). The Delphi Technique: a comparison of results obtained using two expert panels. *International Journal of Nursing Studies*, 30, 227–237.
18. Genç, Z. S. (2016). More Practice for Pre-Service Teachers and More Theory for In-service Teachers of English Language. *Procedia - Social and Behavioral Sciences*, 232(April), 677–683. <https://doi.org/10.1016/j.sbspro.2016.10.092>
19. Harvey, N., & Holmes, C. A. (2012). Nominal group technique: An effective method for obtaining group consensus. *International Journal of Nursing Practice*, 18(2), 188–194. <https://doi.org/10.1111/j.1440-172X.2012.02017.x>
20. Jones, H., & Twiss, B. C. (1978). *Forecasting Technology for Planning Decisions*. Macmillan.
21. Jusun, K. D., & Yunus, M. M. (2017). The effectiveness of using sentence makers in improving writing performance among pupils in Lubok Antu rural schools. *International Conference on Education (ICE2) 2018*, 469–475.
22. Kauffman, A., & Gupta, M. M. (1988). *Fuzzy mathematical models in engineering and management science*. Elsevier Science Inc.
23. Li, K. L., & Razali, A. B. (2019). Idea sharing: Process-based approach to writing in Malaysian english education. *Pasaa*, 58(December), 319–341.
24. Linstone, H., & Turoff, M. (1975). *The Delphi Method: techniques and applications*. Addison-Wesley.
25. Manera, K., Hanson, C. S., Gutman, T., & Tong, A. (2019). Consensus Methods: Nominal Group Technique. *Handbook of Research Methods in Health Social Sciences*, 737–750. <https://doi.org/10.1007/978-981-10-5251-4>
26. Masadeh, T. S. Y. (2017). Opportunities and Barriers of Practicum from the Perspectives of English Language Student Teachers. *Universal Journal of Educational Research*, 5(6), 1059–1071. <https://doi.org/10.13189/ujer.2017.050620>
27. Mazidah, M. R., Chuprat, S., Firdaus, N., & Azmi, M. (2018). Usability Analysis using Modified Nominal Group Technique for Software Traceability Model with Test Effort Estimation. *Open International Journal of Informatics*, 6(3), 1–10.
28. Mustafa, Z. (2018). Proficient way to better English. *New Straits Times*. <https://www.nst.com.my/education/2018/07/389562/proficient-way-better-english>
29. O'Neil, M. J., & Jackson, L. (1983). Nominal Group Technique: A process for initiating curriculum development in higher education. *Studies in Higher Education*, 8(2), 129–138. <https://doi.org/10.1080/03075078312331378994>
30. Parenté, R. J., Hiöb, T. N., Silver, R. A., Jenkins, C., Poe, M. P., & Mullins, R. J. (2005). The Delphi method, impeachment and terrorism: Accuracies of short-range forecasts for volatile world events. *Technological Forecasting and Social Change*, 72(4), 401–411. [https://doi.org/10.1016/S0040-1625\(03\)00024-6](https://doi.org/10.1016/S0040-1625(03)00024-6)
31. Perry, J., & Linsley, S. (2006). The use of the nominal group technique as an evaluative tool in the teaching and summative assessment of the interpersonal skills of student mental health nurses. *Nurse Education Today*, 26(4), 346–353. <https://doi.org/10.1016/j.nedt.2005.11.004>
32. Plomp, T. (2007). Educational design research: An introduction. In T. Plomp & N. Nieveen (Eds.), *An introduction to educational design research*. SLO.
33. Ragin, C. C. (2007). Qualitative comparative analysis using fuzzy sets (fsQCA). In *Configurational comparative analysis*. SAGE Publications.

34. Richey, R., & Klein, J. (2007). *Design and development research: Methods, strategies, and issues*. Routledge.
35. Richey, R., Klein, J., & Nelson, W. A. (2004). Developmental research: studies of instructional design and development. In D. H. Jonassen (Ed.), *Handbook of research on educational communications and technology* (Second, pp. 1099–1130). Lawrence Erlbaum Associates.
36. Seels, B., & Richey, R. (1994). *Instructional technology: The definition and domains of the field*. Association for Educational Communications and Technology.
37. Selvaraj, M., & Aziz, A. A. (2019). Systematic Review: Approaches in Teaching Writing Skill in ESL Classrooms. *International Journal of Academic Research in Progressive Education and Development*, 8(4). <https://doi.org/10.6007/ijarped/v8-i4/6564>
38. Skulmoski, G. J., Hartman, F. T., & Krahn, J. (2007). The Delphi Method for Graduate Research. *Journal of Information Technology Education: Research*, 6, 001–021. <https://doi.org/10.28945/199>
39. Sönmez, H. (2019). An Examination of Needs Analysis Research in the Language Education Process. *International Journal of Education and Literacy Studies*, 7(1), 8. <https://doi.org/10.7575/aiac.ijels.v.7n.1p.8>
40. Timmermans, A. C., & de Boer, H. (2016). An investigation of the relationship between teachers' expectations and teachers' perceptions of student attributes Anneke. *Soc Psychol Educ*, 19, 217–240. <https://doi.org/10.1007/s11218-015-9326-6>
41. Tulley, C. E. (2013). What Are Preservice Teachers Taught about the Teaching of Writing? A Survey of Ohio's Undergraduate Writing Methods Courses. *2(1)*, 38–48.
42. Wang, F., & Hanafin, M. J. (2005). Design-based research and technology enhanced learning environments. *Educational Technology Research and Development*, 53(4), 5–23.
43. Williams, P. L., White, N., Klem, R., Wilson, S. E., & Bartholomew, P. (2006). Clinical education and training: Using the nominal group technique in research with radiographers to identify factors affecting quality and capacity. *Radiography*, 12(3), 215–224. <https://doi.org/10.1016/j.radi.2005.06.001>
44. Xu, Y., & He, L. (2019). How Pre-service Teachers' Conceptions of Assessment Change Over Practicum: Implications for Teacher Assessment Literacy. *Frontiers in Education*, 4(December), 1–16. <https://doi.org/10.3389/educ.2019.00145>
45. Yin, J. (2019). Connecting theory and practice in teacher education: English-as-a-foreign-language pre-service teachers' perceptions of practicum experience. *Innovation and Education*, 1(1), 1–8. <https://doi.org/10.1186/s42862-019-0003-z>
46. Zadeh, L. A. (1965). Fuzzy sets and systems, System Theory. In *Microwave Research Institute Symposia Series XV* (pp. 29–37). Polytechnic Press.
47. Zaki, A. A., & Yunus, M. M. (2018). Mobile learning in teaching writing: Are Malaysian pre-service teachers ready? *International Journal of Education and Research*, 6(7), 157–174.