

Advancing a Model for Enhancing Research Competencies among Non-Academic Staff in Northeast Thailand Higher Education Institutions

Wuthikrai Pommarang¹ & Songsak Phusee-orn¹

¹The Faculty of Education, Mahasarakham University, Thailand

Correspondence: Songsak Phusee-orn, The Faculty of Education, Mahasarakham University, Thailand. E-mail: davidwolf@ncu.ca

Received: August 17, 2023

Accepted: September 25, 2023

Online Published: September 27, 2023

doi:10.5539/hes.v13n4p50

URL: <https://doi.org/10.5539/hes.v13n4p50>

Abstract

The development of research competency among non-academic personnel in higher education institutions is a crucial endeavor that aligns with the evolving demands of the 21st-century workforce. This study employs a comprehensive research and development approach to create an advanced model for enhancing research competencies encompassing knowledge, skill, and attitude. The model's design is informed by meticulous need analysis, ensuring its relevance to the unique challenges faced by non-academic staff. Through expert evaluation, the model's efficacy is demonstrated in improving research-related capacities. The evaluation results underscore its robustness across various dimensions, with significant improvements observed in participants' research competencies. This study highlights the interconnectedness of knowledge, skill, and attitude in fostering research competency and supports the broader view that tailored interventions, derived from thorough need analysis, play a pivotal role in driving meaningful and sustainable improvements in research-related skills and capabilities. Ultimately, this research contributes to the ongoing discourse on non-academic staff empowerment and the advancement of higher education institutions in an increasingly research-focused landscape.

Keywords: research competency, non-academic staff, research and development, career development model

1. Introduction

In the dynamic landscape of the 21st century, possessing strong research competencies has emerged as a pivotal factor for career success across various sectors. Research competencies encompass a set of skills and abilities that enable individuals to effectively gather, assess, analyze, and synthesize information to address complex challenges and make informed decisions (Dobozy, 2013). These competencies go beyond the traditional boundaries of academia, extending their influence into fields such as business, healthcare, technology, and more. Proficiency in research empowers individuals to navigate the ever-evolving sea of information, enabling them to remain adaptable, innovative, and competitive in a rapidly changing world (Okewole, Merritt, Mangezi, Mutiso, Jack, Eley, & Abas, 2020). Whether one is engaged in problem-solving, strategic planning, or decision-making, a foundation in research competencies is indispensable for not only personal growth but also for contributing meaningfully to the advancement of organizations and society as a whole.

The correlation between research competencies and non-academic employees in higher education is progressively acknowledged as a crucial link between administrative operations and the institution's overarching objective (Avenali, Daraio, & Wolszczak-Derlacz, 2022). Although non-academic personnel may not actively participate in conventional research activities, their contributions play a crucial role in facilitating the efficient operation and progress of educational institutions. Research competencies enable them to effectively collect and analyze data, resulting in enhanced decision-making and improved institutional results (Subashini, 2019). For example, admissions officers equipped with proficient research abilities have the capacity to examine patterns in enrollment data in order to develop focused recruitment strategies. In a similar vein, financial managers have the ability to employ research skills in order to examine budgetary information, so enhancing the efficiency of resource distribution. Furthermore, the acquisition of research competencies empowers non-academic personnel with the capacity to provide valuable insights for institutional planning, policy formulation, and strategic endeavors (Tang, 2019). Research competencies serve as a cohesive element that strengthens collaboration,

fosters creativity, and improves the overall efficacy of non-academic staff in their efforts to assist the broader educational objectives.

However, despite the importance of research competencies, non-academic personnel often encounter challenges when it comes to developing and applying these skills in their work (Mugabo, 2015). This predicament can be attributed to the fact that many non-academic roles traditionally require a Bachelor's degree as a minimum qualification. While such degrees offer a foundational understanding of various subjects, they often provide only basic exposure to research concepts. As a result, individuals in these roles might lack a comprehensive grasp of research methodologies, impeding their ability to effectively apply these techniques in their professional responsibilities. Without a solid understanding of research principles, these staff members might struggle to navigate complex datasets, interpret findings, and contribute substantively to evidence-based decision-making. This limitation further extends to the realm of independent research, as the absence of in-depth training can hinder their capacity to initiate and conduct research projects on their own. This disparity underscores the need for tailored training and development programs that equip non-academic personnel with the necessary research competencies to bridge the gap between their existing knowledge and the demands of their roles in a rapidly evolving educational landscape.

Therefore, in recognition of these challenges, the development of a comprehensive model for enhancing research competencies among non-academic staff becomes crucial. To address this gap, an innovative approach that combines need analysis and curriculum development can be harnessed to create a learning model tailored to the specific requirements of non-academic personnel. By conducting a thorough needs assessment, educational institutions can identify the precise areas where research competencies are lacking among staff members. This analysis forms the foundation for designing a targeted curriculum that aligns with the unique responsibilities and contexts of non-academic roles within higher education institutions. By tailoring the curriculum to address these identified needs, the learning model not only addresses the existing knowledge gaps but also ensures the practical application of research competencies within the daily work of non-academic staff. In doing so, this model establishes a symbiotic relationship between theoretical knowledge and real-world implementation, empowering non-academic personnel to navigate the challenges of the 21st-century educational landscape with competence and confidence.

2. Literature Review

2.1 Research Competencies

Scholars (Ismail & Meerah, 2012; Roman, 2021; Saunders & Jamieson, 2020) have presented the components of research competencies. In detail, an individual should develop their knowledge of research, skills in practical involvement in research development, and researcher attitude. The details of each component can be seen below.

2.1.1 Research Knowledge

Research knowledge forms the bedrock of research competencies, encompassing a comprehensive understanding of foundational research principles, methodologies, and ethical considerations. This component involves being well-versed in the various research paradigms, study designs, and data collection methods. Proficiency in research knowledge equips individuals with the ability to critically assess existing literature, identify gaps in knowledge, and formulate research questions that contribute to the advancement of their respective fields. A solid grasp of research knowledge enables non-academic staff to discern reliable sources of information, evaluate the credibility of data, and distinguish between various research methodologies, ultimately supporting evidence-based decision-making within their roles.

2.1.2 Research Skills

The second vital component of research competencies lies in the development of research skills. These skills encompass the practical tools and techniques required to effectively gather, analyze, and interpret data. Proficiency in research skills involves the ability to design research studies, collect data using appropriate methods, and analyze data using relevant statistical or qualitative techniques. Furthermore, research skills extend to the competence in using research software, data visualization tools, and communication platforms to present findings coherently and persuasively. Non-academic staff equipped with strong research skills can not only contribute to institutional improvement but also actively engage in collaborative research projects that address complex challenges in higher education.

2.1.3 Attitude toward Research

The attitude toward research constitutes the third integral component of research competencies. Possessing a positive attitude toward research involves cultivating a curiosity-driven and open-minded approach to knowledge

acquisition. It entails recognizing the value of empirical evidence, embracing a willingness to explore new ideas, and maintaining a commitment to intellectual growth. A proactive attitude toward research encourages non-academic staff to seek out opportunities for continuous learning, engage in interdisciplinary discussions, and remain receptive to adapting research findings to enhance their professional roles. Moreover, an attitude that values research fosters a culture of innovation within educational institutions, where staff members actively contribute to a thriving research community and contribute to the institution's broader goals.

2.2 Research Development Approach in Career Development

The integration of research development into career advancement is a strategic approach that not only enhances individual capabilities but also bolsters institutional progress (Erfani, 2019; Kainulainen, 2014; Lederman & Maloney, 2003). This approach hinges on a structured framework involving the stages of need analysis, innovation development, and implementation of these innovations (Erfani, 2019). By adopting this methodology, educational institutions can effectively nurture the knowledge, skills, and attitudes necessary for the continuous improvement of careers among non-academic staff.

2.2.1 Need Analysis

At the heart of the research development approach lies the meticulous process of need analysis. Recognizing that the career trajectories of non-academic staff evolve within unique contexts, the initial step involves understanding the specific gaps and challenges they face. Through comprehensive needs assessments, institutions can pinpoint areas where research competencies are lacking or insufficient. This analysis sheds light on the most pertinent skill deficits, allowing tailored interventions that are closely aligned with the roles, responsibilities, and aspirations of the staff members (Juan, 2014).

2.2.2 Innovation Development

Following need analysis, the innovation development phase comes into play. This stage is characterized by the creation of novel strategies and programs aimed at bridging the identified gaps. Leveraging the insights from need analysis, institutions can design innovative curricula, workshops, training modules, and mentorship initiatives that are custom-tailored to address the specific research competencies required for non-academic staff. These innovations might encompass experiential learning opportunities, practical exercises, and collaborative projects that facilitate the application of research competencies in real-world scenarios.

2.2.3 Implementation of Innovation

The third and pivotal stage is the effective implementation of the developed innovations. Institutions must ensure that the new programs and initiatives are seamlessly integrated into the professional development pathways of non-academic staff. This entails providing accessible resources, organizing workshops, and fostering an environment that encourages participation and active engagement. By enabling staff to acquire and refine research competencies in a supportive and conducive setting, institutions empower them to not only enhance their own careers but also contribute positively to the institution's overall growth and excellence.

The research development approach in career development operates on the premise that continuous learning and skill enhancement are indispensable for career growth and fulfillment. By cultivating research competencies through a structured approach, institutions not only uplift the capabilities of non-academic staff but also fortify the institution's reputation and effectiveness. This approach nurtures a culture of ongoing improvement, fosters a sense of empowerment and ownership among staff, and propels educational institutions toward continued success in an ever-evolving landscape.

2.3 Previous Studies

Scholars have diligently employed the research development approach to formulate and refine developmental models in diverse facets of career advancement (e.g., Betts et al., 2009; Chimplee et al., 2017; Kaewprom et al., 2021; Phipps et al., 2018; Reddan & Rauchle, 2017). The utilization of this approach is evident through a collection of noteworthy studies that have delved into the optimization of learning simulations, the enhancement of teacher competencies, the evolution of teacher development models, and the novel concept of peer mentoring. For instance, Betts et al. (2009) explored the realm of learning simulations within the framework of a quinary career development model. Chimplee et al. (2017) undertook an ambitious endeavor to enhance teacher competencies in research by employing participatory action research in a school setting. Kaewprom et al. (2021) concentrated on the development of a teacher development model for 21st-century learning management within the educational context. Through these seminal works, it becomes evident that the research development approach has served as a cornerstone in shaping career development models across diverse fields. These studies not only underscore the importance of aligning research competencies with professional advancement but also

emphasize the potential of tailored developmental models to optimize individuals' career trajectories. Therefore, the current study employed the research development approach to enhance research competencies of non-academic staff in northeast higher education and proposed the following objectives: to analyze components and the necessities for the development of a model for research competencies among non-academic personnel in higher education institutions in Northeastern Thailand, to develop a model for research competencies among non-academic personnel in higher education institutions in Northeastern Thailand, and to implement the model for research competencies among non-academic personnel in higher education institutions in Northeastern Thailand.

3. Methodology

The study employed the processes of research and development approach and was divided into 3 stages. The details of each stage can be seen below.

3.1 Analyzing Components and the Necessities for the Development of A Model for Research Competencies among Non-academic Personnel in Higher Education Institutions in the Northeastern Region

The initial phase of the study is dedicated to dissecting the elements and requirements integral to the formulation of a research competencies model tailored for non-academic personnel within higher education institutions situated in Northeastern Thailand. To carry out this analysis, an evaluative tool was employed, specifically designed for assessing the key indicators of research competencies among non-academic staff in these educational settings. This evaluative instrument was meticulously developed through an examination of pertinent documents pertaining to research competency. The outcome of this meticulous process led to the identification of 37 preliminary indicators, which were categorized into knowledge (n=13), skills (n=12), and attitude (n=12). To validate these preliminary indicators, a panel of 5 experts meticulously assessed them for content validity. Subsequently, these indicators were administered to a diverse sample of 1,208 respondents, strategically drawn from a population of 9,231 non-academic personnel across 5 higher education institutions in Northeastern Thailand.

Participants in the study were tasked with providing input on the identified indicators concerning research competencies for non-academic staff within higher education institutions. Each indicator was explored from two distinct vantage points: its necessity and its existing state. Respondents conveyed their evaluations using a 5-point Likert scale. The dataset was subjected to analysis through the utilization of the Priority Needs Index (PNI_{modified}) (Wiratchai, 1999; Wiratchai & Wongwanich, 1998), which involves calculating the difference between the reported necessity and the current state, followed by dividing this difference by the current state. If the resultant value surpassed a predefined threshold of 0.3, the respective indicator was deemed pertinent for inclusion within the model under construction.

3.2 Developing a Model for Research Competencies among Non-academic Personnel in Higher Education Institutions in Northeastern Thailand

The second stage aims to initiate and execute a pilot study for the research competencies model designed for non-academic personnel within higher education institutions in Northeastern Thailand. Building upon the indicators identified during the initial phase, these indicators were carefully utilized as building blocks to draft a preliminary version of the model. To ensure the robustness and effectiveness of this model, a team of 5 experts was entrusted with the critical task of evaluating its components and structure.

3.3 The Implementation of the Model for Research Competencies among Non-academic Personnel in Higher Education Institutions in Northeastern Thailand

Stage 3 involves the practical implementation of the research competencies model specifically designed for non-academic personnel within higher education institutions in Northeastern Thailand. This stage saw the participation of 12 voluntary non-academic personnel from higher education institutions in the region, engaged in a workshop-based process. These participants actively engaged with the model, which encompassed 7 distinct topics: 1) General Content on Research, 2) Current Situation, Problems, and Development Needs, 3) Research Design, 4) Literature Review, 5) Research Innovation, 6) Research Data Analysis, and 7) Research Results Reporting.

Prior to and after the utilization of the model, an evaluation form aimed at assessing research competencies among non-academic personnel in higher education institutions in Northeastern Thailand was administered. This evaluation form focused on capturing the participants' levels of knowledge, skills, and attitudes related to research. The collected data underwent analysis through descriptive statistics and the paired sample t-test, enabling a comprehensive examination of the changes in participants' research competencies following their

engagement with the model.

4. Results

4.1 Indicators of Research Competencies for Non-academic Personnel

The results of document analysis and expert consultation result in three aspects of the research competencies for non-academic personnel. The 37 indicators of research competencies for non-academic personnel can be seen in table 1.

Table 1. Indicators of research competencies for non-academic personnel

Knowledge	Skill	Attitude
Non-academic staff working in university should be equipped with the knowledge of:	Non-academic staff working in university should be equipped with the skills to:	Non-academic staff working in universities should possess a range of attitudes, including:
1) basic concept of research,	1) analyze research problems,	1) a commitment to self-learning,
2) research methodology,	2) identify research problems,	2) a sense of pride in learning from real-world experiences,
3) knowledge of the significance of research,	3) search, select, and utilize relevant documents and research,	3) a recognition of their own research achievements,
4) methods in analyzing research problems,	4) utilize research tools,	4) an appreciation for equal research capabilities among all individuals,
5) defining research problems	5) summarize ideas into conclusive statements,	5) an understanding of the value and advantages of research,
6) techniques in reviewing relevant, literature	6) organize and write research report,	6) a strong sense of accountability for task completion,
7) generating and defining research, innovation	7) define and create and research innovations,	7) an openness to discussion and collaboration with others,
8) research design,	8) design research studies,	8) a proactive approach to collaborative learning,
9) research proposal writing,	9) apply innovation to practical problem solving,	9) an acknowledgment of the importance of managerial support,
10) applying innovation to problem solving in practical work,	10) learn from real-world practice,	10) an encouragement to reflect on their own research learning,
11) data analysis,	11) summarize, and discuss research results, and	11) a determination to engage in research activities, and
12) summarizing and discussing research results, and	12) analyze data and report results that link to real-world problem-solving.	12) a belief in their own research competencies.
13) writing research report.		

Table 1 demonstrates the pre-indicators of research competencies for non-academic personnel. They were involved in a need analysis assessment in finding their Priority Needs Index with the determining criteria of 0.3. The data collected from 1,208 informants is shown below.

Table 2.

Aspects of research competency	Importance (I)	Degree of success (D)	PNImodified	Priority
1 Knowledge	3.98	1.63	1.50	1
2 Skill	3.89	1.64	1.40	3
3 Attitude	3.96	1.62	1.47	2
Average	3.94	1.63	1.46	-

The analysis of the results reveals that all aspects exceeded the 0.3 criterion. The aspects of knowledge, attitude, and skill exhibited PNImodified scores of 1.50, 1.47, and 1.40, respectively, with the highest to lowest order. Specifically, all 13 indicators in the knowledge aspect surpassed the set criteria, exhibiting a PNImodified range between 1.04 and 2.70. Similarly, in the attitude aspect, all 12 indicators demonstrated values ranging from 1.03 to 1.81. Meanwhile, 12 indicators within the skill aspect showcased values within the range of 0.98 to 1.66.

Consequently, all indicators across these three facets were deemed eligible for inclusion in the model development process.

4.2 The Creation of the Model and the Subsequent Expert Evaluation

The model's development was informed by the identified indicators, resulting in the formulation of seven distinct topics: 1) General Content on Research, 2) Current Situation, Problems, and Development Needs, 3) Research Design, 4) Literature Review, 5) Research Innovation, 6) Research Data Analysis, and 7) Research Results Reporting. The implementation process was geared toward enhancing research competencies encompassing knowledge, skill, and attitude. Prior to actual implementation, the model underwent assessment by a panel of five experts with expertise in education management and research, and the outcomes of this evaluation are presented in Table 3.

Table 3. The results of expert evaluation on the developed model

No.	Evaluation aspects	Degree of appropriateness		
		\bar{x}	S.D.	Interpretation
1	Background and rationale	4.40	0.55	High
2	Principles and theories used in model development	4.60	0.55	Very High
3	Principles of the model	4.60	0.55	Very High
4	Objectives	4.80	0.45	Very High
5	Content	4.60	0.55	Very High
6	Processes in the research competency development	4.60	0.55	Very High
7	Evaluation and assessment	4.80	0.45	Very High
Average		4.63	0.52	Very High

The results revealed that, overall, the drafted model was evaluated at the highest level ($\bar{x}= 4.63$, S.D = 0.52). In detail, the aspects of Background and rationale, Principles and theories used in model development, Principles of the model, Objectives, Content, Processes in the research competency development, and Evaluation and assessment, were evaluated at a high to very high level. It could be interpreted that the comprehensive evaluation results reflect a strong alignment and robustness of the research competency development model across its various dimensions.

4.3 The Implementation of the Model

The model for research competencies among non-academic personnel in higher education institutions in Northeastern Thailand was implemented to develop 12 participants' research competencies. The aspects of evaluation include knowledge, skill, and attitude of research. The 31 indicators were also employed in the evaluation form. The results of the model implementation can be seen in Table 4.

Table 4. Participants' research competency before and after the model implementation

Aspects	Process	(n)	No. of indicators	\bar{x}	S.D	df	t	P-Value
Knowledge	Pretest	12	13	1.29	0.51	11	22.00	.000*
	Posttest	12		3.82	0.50			
Skill	Pretest	12	12	1.01	0.51	11	40.53	.000*
	Posttest	12		3.83	0.48			
Attitude	Pretest	12	12	1.38	0.50	11	37.83	.000*
	Posttest	12		4.25	0.44			

* $p>0.05$

After participating in the model implementation process, it is evident that the participants were able to enhance their research competencies across all aspects. Specifically, the paired samples t-test results reveal significant differences in participants' research competencies related to knowledge ($t=22.00$, $p=0.00$), skill ($t=40.53$, $p=0.00$), and attitude ($t=37.83$, $p=0.00$). This outcome could be interpreted as a clear indication of the model's effectiveness in fostering meaningful improvements in participants' research-related knowledge, skills, and attitudes.

5. Discussion

It could be interpreted from the results of the study that there exists a compelling necessity to enhance research competencies encompassing knowledge, skill, and attitude. The utilization of a research and development

approach has yielded a model that effectively enhances participants' research competency across all dimensions. The outcomes of this study invite discussions on several pertinent issues.

Research competency is a multi-faceted construct that relies on a synergistic combination of knowledge, skill, and attitude (Ismail & Meerah, 2012; Roman, 2021; Saunders & Jamieson, 2020). In the context of this study, knowledge equips individuals with the theoretical foundations and conceptual frameworks necessary for effective research engagement. Skill pertains to the practical abilities required to conduct research, including data collection, analysis, and interpretation. Attitude encompasses the disposition to embrace research challenges, persevere in the face of obstacles, and approach research endeavors with curiosity and openness. The positive correlation among these three components is vital for the holistic development of research competency.

The successful enhancement of participants' research competency through the research and development approach is congruent with prior research findings. Notable studies such as those by Betts et al. (2009), Chimplee et al. (2017), Kaewprom et al. (2021), Phipps et al. (2018), and Reddan & Rauchle (2017) have also demonstrated the efficacy of this approach in formulating models that greatly benefit career development.

To discuss, the meticulous process of conducting a need analysis plays a pivotal role in the successful development of an advanced model aimed at enhancing research competency among non-academic personnel in higher education institutions. This approach acknowledges the unique challenges and gaps that are prevalent within this specific group, recognizing that their roles and responsibilities often differ from those of academic staff. By meticulously assessing these distinct needs, the model's design becomes tailored to address the precise areas requiring improvement, ensuring that the interventions are not only precise but also effective.

This tailored approach significantly contributes to the positive outcomes observed in improving research competency. Rather than employing a generalized or one-size-fits-all strategy, the model aligns itself with the specific requirements and deficiencies identified through the need analysis. This alignment ensures that the interventions are relevant, relatable, and resonant with the non-academic personnel's daily tasks and responsibilities. As a result, participants are more likely to engage wholeheartedly with the model's content, recognizing its direct applicability to their work. This personalized resonance fosters a sense of ownership and relevance, ultimately motivating participants to actively participate in the development of their research competencies.

Furthermore, this targeted approach paves the way for a more meaningful and sustainable improvement trajectory. The interventions become more impactful because they address genuine challenges faced by non-academic staff. This authenticity enhances the participants' investment in the learning process, as they witness tangible enhancements in their research-related skills and knowledge that directly impact their work performance. Consequently, the improvements are not isolated outcomes but rather catalysts for enduring growth.

6. Conclusion

In conclusion, this study has shed light on the paramount importance of research competency development among non-academic personnel in higher education institutions. The model formulated through a meticulous research and development approach has demonstrated its effectiveness in enhancing participants' research competencies encompassing knowledge, skill, and attitude. The comprehensive evaluation results have underscored the model's robustness across various dimensions, reflecting its potential as a valuable tool for improving research-related capacities in this context.

The study's findings reaffirm the interconnectedness of knowledge, skill, and attitude in fostering research competency. This interplay highlights the necessity of equipping non-academic staff with a well-rounded skill set that encompasses both theoretical understanding and practical application. The successful implementation of the research and development approach in this study aligns with previous research, underscoring the method's efficacy in producing beneficial models that promote career development.

Furthermore, the tailored nature of the advanced model, derived from a meticulous need analysis, has emerged as a significant determinant of its success. This targeted approach addresses the unique challenges faced by non-academic personnel and presents interventions that resonate with their daily responsibilities. As a result, participants experience meaningful and sustainable improvements in their research competencies, leading to a more empowered and skilled workforce within higher education institutions.

In essence, this study underscores the transformative potential of a well-crafted research competency development model that takes into account the specific needs and challenges of non-academic staff. By enhancing their knowledge, skills, and attitudes, this model contributes to their professional growth, fosters a

culture of research engagement, and ultimately strengthens the higher education landscape. The implications of these findings extend beyond the confines of this study, advocating for continued investment in research competency development as an essential aspect of non-academic staff empowerment and the broader advancement of higher education institutions.

Acknowledgments

We greatly appreciate the valuable contributions of our community advisory committee members. We would also like to thank Mahasarakham University and every team member who took the time to participate in this study.

Authors contributions

Wuthikrai Pommarang was responsible for study design, data collection and draft of the manuscript. Songsak Phusee-orn revised and approved the final manuscript.

Funding

The project is supported by Mahasarakham University.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

Open access

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

References

- Avenali, A., Daraio, C., & Wolszczak-Derlacz, J. (2022). Determinants of the incidence of non-academic staff in European and US HEIs. *Higher Education*, 85, 1-29. <https://doi.org/10.1007/s10734-022-00819-7>
- Betts, K., Lewis, M., Dressler, A., & Svensson, L. (2009). Optimizing learning simulation to support a quinary career development model. *Asia Pacific Journal of Cooperative Education*, 10(2), 99-119.
- Chimplee, A., Jiraro, P., & Lila, S. (2017). The development of model to enhance teachers competency in research by using participatory action research in Pattaya city school. *Journal of Graduate Research*, 8(2), 15-35.
- Dobozy, E. (2013). Research Skills for the Future: Research Workforce Under the Spotlight. *Journal of Research Practice*, 9.
- Erfani, H. (2019). *Research and Development*. Saarbrücken, Germany: LAP LAMBERT Academic Publishing.
- Ismail, R., & Meerah, T. S. M. (2012). Evaluating the Research Competencies of Doctoral Students. *Procedia - Social and Behavioral Sciences*, 59, 244-247. <https://doi.org/10.1016/j.sbspro.2012.09.271>
- Juan, L. I. (2014). Literature Review of the Classifications of 'Needs' in Needs Analysis Theory. *International*

- Journal of Education and Literacy Studies*, 2(3), 12-16. <https://doi.org/10.7575/aiac.ijels.v2n.3p.12>
- Kaewprom, C., Pollaharn, C., & Ruangsuan, C. (2021). The Model of Teacher Development in Learning Management for 21st Century for Educational Opportunity Schools under Khon Kaen Primary Educational Service Area Office 3. *Dhammathas Academic Journal*, 21(4), 195-212.
- Kainulainen, S. (2014). Research and Development (R&D). In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 5516-5517). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-007-0753-5_2482
- Kainulainen, S. (2014). Research and Development (R&D). In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 5516-5517). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-007-0753-5_2482
- Lederman, D., & Maloney, W. F. (2003). *R&D and Development*. Washington, DC: World Bank. <https://doi.org/10.1596/1813-9450-3024>
- Mugabo, L., Rouleau, D., Odhiambo, J., Nisingizwe, M. P., Amoroso, C., Barebwanuwe, P., ... Hedt-Gauthier, B. L. (2015). Approaches and impact of non-academic research capacity strengthening training models in sub-Saharan Africa: A systematic review. *Health Research Policy and Systems*, 13(1), 30. <https://doi.org/10.1186/s12961-015-0017-8>
- Okewole, H., Merritt, C., Mangezi, W., Mutiso, V., Jack, H., Eley, T., & Abas, M. (2020). Building Career Development Skills for Researchers: A Qualitative Study Across Four African Countries. *Annals of Global Health*, 86, 40. <https://doi.org/10.5334/aogh.2759>
- Phipps, W., Kansime, R., Stevenson, P., Orem, J., Casper, C., & Morrow, R. A. (2018). Peer Mentoring at the Uganda Cancer Institute: A Novel Model for Career Development of Clinician-Scientists in Resource-Limited Settings. *Journal of Global Oncology*, 4, 1-11. <https://doi.org/10.1200/JGO.17.00134>
- Reddan, G., & Rauchle, M. (2017). Combining Quality Work-Integrated Learning and Career Development Learning through the Use of the SOAR Model to Enhance Employability. *Asia-Pacific Journal of Cooperative Education*, 18(2), 129-139.
- Roman, A. G. (2021). Research Competencies and Performance of Higher Education Institutions (HEI) Faculty. *Research Competencies and Performance of Higher Education Institutions (HEI) Faculty*, 78(1), 8-8. <https://doi.org/10.47119/IJRP100781620211975>
- Saunders, M. V., & Jamieson, L. M. (2020). Contextual Framework for Developing Research Competence: Piloting a Validated Classroom Model. *Journal of the Scholarship of Teaching and Learning*, 20(3). <https://doi.org/10.14434/josotl.v20i3.24487>
- Subashini, J. K. W. (2019). *Career Development for Performance Enhancement of Non-Academic Staff in Higher Education Institutes*.
- Tang, K. N. (2019). Beyond employability: Embedding soft skills in higher education. *The Turkish Online Journal of Educational Technology*, 18(2), 1-9.
- Wiratchai, N. (1999). *LISREL model: Statistical Analysis for Resarch*. Bangkok, Thailand: Chulalongkorn University Printing House.
- Wiratchai, N., & Wongwanich, S. (1998). *Synthesizing Educational Research through Discourse Analysis and Content Analysis*. Bangkok: The National Education Commission Office, Office of the Prime Minister.