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Capacity Building of Early Career Researchers through the Mentoring Program in Kazakhstan

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Abstract

Informed policies must be created to support teachers' capacity for research and their involvement in it. The Mentoring Program for Research Capacity Building of Young Researchers of Regional Higher Education Institutions of the Republic of Kazakhstan was established in order to meet this requirement. The present research aimed to investigate the effectiveness of the program and the mentees' perspectives on it. The longitudinal design case study used mixed methodologies to collect and analyze quantitative and qualitative data. The study participants comprised 12 early career researchers affiliated with the universities of the Western region of Kazakhstan. A quasi-experimental nonequivalent control group design with a single group time-series design was employed to identify differences in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program. One-to-one interviews with 9 mentees were conducted to have an in-depth picture of early career researchers' perspectives on the mentoring program and support required for them. The results showed that the early career researchers' level of perceived research engagement increased from pre-intervention to post-intervention of the mentoring program. The interviews with the program mentees outlined their overall positive perspectives on the mentoring program scoring it 9.7 on a 10-point scale. The mentoring program allowed them to develop analytical skills, critical thinking, and research planning. The program mentors received 9.9 on a 10-point scale because of the information and experience they shared with mentees, which helped them develop their research capacity. The research results and developed strategies could be applied to many higher education institutions that intend to support their researchers. Research development officers, university administration, and policymakers may utilize the findings of this study to create a complete framework for strengthening research capacity and infrastructure from both organizational and individual perspectives.

Keywords: *Higher education institutions, early career researcher, research capacity, mentoring program, capacity building.*

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Introduction

Higher education institutions' (HEIs) staff members prioritizing teaching and professional development are strongly encouraged to do research given that tenure-track faculty are required to engage in research to remain in the academy (Tarman & Chigisheva, 2017). At the same time, academic staff, particularly young researchers, are difficult to recruit due to a variety of obstacles that make pursuing a research career in higher education institutions more difficult (Efimova, 2021). Every early career researcher encounters obstacles and chances to improve their work, frequently at the same time (Adedokun & Oyetunde-Joshua, 2024; Fenton et al., 2016).

This urges a need for developing informed policies for promoting teacher research engagement and fostering their research capacity. One of such initiatives offered by the authors is the Mentoring Program for Research Capacity Building of Young Researchers of Regional HEIs of the Republic of Kazakhstan, a three-year-long project supported by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan. The goal of the mentoring program is to give HEIs academic staff members who are just starting out in their research careers the chance to work independently on research projects under the supervision of experienced scholars from a variety of backgrounds. Mentees experience firsthand what it's like to collaborate closely with peers and carry out authentic and cutting-edge research.

The purpose of the study is twofold. Firstly, this study aims to investigate the effectiveness of a mentoring program for HEIs academic staff in developing their research capacity by identifying differences in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program. Secondly, this study will explore the perspectives of the early career researchers on the mentoring program. The findings of the present investigation, based on a study of the research capacity building mentoring program's accomplishments and a hypothesis-driven exploration of outcomes, as well as the program participants' perspectives on it will contribute to university policies, practices, and resources on fostering research capacity building and researcher productivity.

Literature Review

The challenges of a rapidly changing world are embedded in numerous dimensions of society among which is the human development system (Fongkanta et al., 2022). Faculty members are widely recognized as one of the most important elements of an institution's research capacity

(Shehzad et al., 2014), and university policies, practices, and resources have a significant impact on researcher productivity (Kyvik & Aksnes, 2015). Thus, there is rising demand on higher education institutions' academic staff members to perform and publish research, obtain funding for research initiatives from internal or external sources, and generate noteworthy research outcomes (Strielkowski & Chigisheva, 2018; Yaun et al., 2020). Research proficiency is one of the key competencies of educators in the modern day, as it aids in the development of pedagogies that support students' learning about and through research (Willison & O'Regan, 2007). HEIs instructors must develop their research skills to keep up with current events and provide students with a top-notch education. Teachers can improve their capacity to deliver high-quality instruction and make a significant contribution to the area of education by consistently improving their research abilities.

Research engagement of HEIs academic staff is challenged by various factors. Bahadori et al. (2015) outlines such barriers to research engagement as obstacles to research project design and development, approval and implementation, managerial and administrative issues, personal issues, publication of research results. Besides, university teachers' barriers to regularly engaging in research include the low priority of research in tertiary institutions and poor funding of the education sector (Baro et al., 2017). Among other obstacles to doing research are the inability to balance teaching and research due to a faculty overload (O'Connor et al., 2011), academic writing skills weaknesses (Walden & Bryan, 2010), and the challenge for early career researchers to make a name for themselves. Moreover, early career researchers encounter difficulties competing with those with more established credentials in the fiercely competitive research environment (Bazeley, 2003). Kuzembayeva et al. (2022) depict that the early career university academic staff in Kazakhstan confront obstacles including a lack of time for research, challenges in publishing research findings, and a dearth of university assistance and research mentorship.

These findings prove that young researchers need specifically targeted policies to facilitate their research careers (Kuzembayeva et al., 2022). Faculty members play an important role in higher education institutions (Olo et al., 2021), and faculty scholarly projects improve the research culture of a certain university (Bai et al., 2012). To improve research culture at higher education institutions and empower academic staff, universities pursue specific strategies for building research capacity (Litwin, 2009).

The term “research capacity-building” refers to the ongoing enhancement of a group's capacity to conduct, publish, and distribute scientific research that advances regional or national development (Fredua-Kwarteng, 2021). Research capacity building is as well defined as a process of developing sustainable abilities and skills enabling individuals and organizations to perform high quality research (Trostle, 1992). Thus, building one's own research capacity include writing for scholarly journals, research techniques, ethical principles, and specialized knowledge and training in particular research competencies and theme areas.

Education and training in particular research competencies and subject areas, such as writing for scholarly publications, research procedures, and ethical principles, are necessary for individual progress. Building research capacity involves a variety of activities, such as giving research activities administrative, leadership, and other support, setting up ongoing scientific research education and training for professors and lecturers, mentoring and coaching programs for junior researchers, and establishing and maintaining minimal laboratory and library facilities as well as information storage and retrieval systems (Fredua-Kwarteng, 2021).

Key indicators of strengthening individual research capacity include: short-term training; long-term training, particularly for MSc and PhD; access to online and library resources; the presence of a supervising team; funding for attending workshops and conferences; availability of coaching and mentoring; salary supplements; re-entry grants after a PhD in another country; technical support; and the researcher’s level of responsibility (Nchinda, 2002). The research skill development framework considers 6 facets of research such as clarifying and selecting a research topic, finding and generating educational innovation and data using appropriate methodologies, evaluating and reflecting on research processes, organizing and managing data, analyzing and synthesizing data to produce coherent individual and team understandings, and communicating and applying research results (Willison & O’Regan, 2007).

One of the ways to foster young researchers’ research capacity is by providing an expert mentoring program, in which mentor is conceptualized as “a wise and trusted guide and advisor”, providing support and training such as “How to write a scientific publication, a research proposal” and on various research skills (Nchinda, 2002). As stated by Huenneke et al. (2017), in established research institutes, research expansion is frequently sought by adding academic members to existing departments while providing mentoring and infrastructure to optimize individual achievement. This can be resolved by choosing people who require ongoing training and education

in research as well as experienced researchers who can directly instruct, coach, or mentor aspiring researchers (Fredua-Kwarteng, 2021).

Engaging early career researchers in mentoring programmes enhancing their confidence, visibility, credibility, and professional networks is addressed in several studies (Fenton et al., 2016; Gottlieb & Travis, 2018; Bohleber et al., 2020). Initiatives to support individuals, groups, organizations, and networks are included in the interventions to build research capacity for, within, and by practice. Fellowships, training programs, scholarships, and the creation of support infrastructures, such as research practice networks, are a few examples (Fenton et al., 2001). Funding research and development support units located within universities are aimed at supporting both new and established researchers, however scholars and policy advisors point out that there aren't enough evaluation frameworks to track development and develop a knowledge base of what works (Farmer & Weston, 2002). Researchers believe that studies of the efficacy and impact of these targeted university and government investments are a valuable method for institutional leaders to make the most of existing and future programs (Huenneke et al., 2017).

The necessity of creating well-informed policies to support teacher research capacity and engagement is addressed by the authors' proposed initiative – the Mentoring Program for Research Capacity Building of Young Researchers of Regional HEIs of the Republic of Kazakhstan. The effectiveness of the program and the mentees' perspectives on it can support university administration, and policymakers in creating a complete framework for strengthening research capacity and infrastructure from both organizational and individual perspectives.

The Mentoring Programme for Early Career Researchers of Regional Universities in Kazakhstan

Research in mentoring is receiving interest from a variety of disciplines as mentoring can be conceptualized in terms of the shape it takes, the function it provides, or its learning-centered nature (Kingiri et al., 2022). According to Halpaap et al. (2020), research mentorship programs provide a dynamic learning opportunity for knowledge acquisition and sharing for both mentors and mentees. When creating a mentorship program, it is important to take into account a combination of local context-relevant structured and unstructured components. Building sustained research capacity building programs in academic subjects that are transdisciplinary in nature, like innovation and development studies, requires the incorporation of these context-specific features.

The Mentoring Program for Research Capacity Building of Young Researchers of Regional HEIs of the Republic of Kazakhstan (Research project, 2022) is a three-year-long project supported by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan. The mentoring program's goal is to give HEI academic staff members who are just starting out in their research careers the chance to work independently on research projects under the supervision of experienced scholars from a variety of backgrounds. Mentees experience firsthand what it's like to collaborate closely with peers and carry out authentic and cutting-edge research. Theoretical and practical materials on the development of the mentoring model and the results of its implementation are presented the project's website.

The mentoring program started in 2022 and lasted for eighteen months. The program authors developed the Plan for the introduction of the mentoring model for early career researchers of regional universities of the Republic of Kazakhstan to build their research capacity for 2022-2024 (Maydangalieva et al., 2023), which includes 43 events differing in the subject and structural combination of various forms of their implementation (Introductory session, Consulting, Workshop, Personal case of mentors, Personal case of mentees, Seminar, Scientific session), which allows early career researchers to maintain research activity under the supervision of mentors.

To implement this Plan for the implementation of the mentoring model, 12 young scientists were selected from regional universities in Western Kazakhstan (4 people from 2 universities in Oral city, 7 people from 2 universities in Aktobe city, 1 person from a university in Atyrau city), after which a group chat was created in the WhatsApp social media platform. A corresponding agreement has been concluded with each participant of the experimental group. Each meeting within the framework of this Plan was held in the ZOOM format, training materials were sent to each participant.

Currently, one of the effective measures at the initial and final stages (2022-2024) of the mentoring model implementation is the mentees' performance of the research and development work (R&D) on their chosen topic. Thus, payments in the amount of KZT 3,180,000 were made to the R&D executors represented by 12 early career researchers on the basis of the reports on completed work provided by them for 2023 with supporting documents.

Research Questions and Hypotheses

Aiming to investigate the effectiveness of a mentoring program for HEIs academic staff in developing their research capacity and the mentees' perspectives on it, the present study addressed the following research questions:

RQ1: What is the effectiveness of a mentoring program for early career researchers in developing their research capacity?

RQ2: What are the early career researchers' perspectives on the mentoring program and support required for them?

The following hypotheses were formulated:

H_0: There is no statistically difference in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program.

H_1: There is a statistically difference in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program.

Methods and Materials

Research Design

This longitudinal design case study used mixed methodologies to collect and analyze quantitative and qualitative data. To present a thorough picture of the course of a longitudinal study, it is necessary to analyze and integrate quantitative and qualitative data, as well as develop joint displays to draw recurrent meta-inferences (Creswell, 2015). Longitudinal research with repeated data collection, which focuses on the temporality of a phenomenon (Plano Clark et al., 2015), was combined with a case study, "an empirical method that investigates a contemporary phenomenon in depth and within its real-world context, and an all-encompassing mode of inquiry, with its own logic of design, data collection techniques, and specific approaches to data analysis" (Yin, 2018), to "yield a complete understanding" (Gutterman & Fetters, 2018).

The data was collected from HEIs' early career researchers, admitted to the research mentoring program. All participants signed an informed consent form before entering the study.

The capacity building programme was guided by Bloom's taxonomy covering six levels within the cognitive domain, from the simple remembering of facts, as the lowest level, through to a more complex level, creating (Bloom & Krathwohl, 1956). During the capacity building, participants were made to translate the knowledge acquired after each session into developing a capstone

(research proposal). The Kirkpatrick levels Model (Kirkpatrick & Kirkpatrick, 2022), proposing four level of evaluation of training programmes: reaction, learning, behavior and result (Kirkpatrick & Kirkpatrick, 2009), was employed for evaluation of the effectiveness of capacity building and mentorship programme.

To start with, all mentees responded to a structured questionnaire before the training, which served as baseline data. Post training evaluations were carried out and compared with baseline to measure the extent to which mentees acquired knowledge (learning). Moreover, mentees completed a mentoring program evaluation form to determine the relevance of the training to the job as well as their satisfaction (reaction). During the training, mentees developed a research proposal to address the implementation challenges of that intervention. Mentees' proposals were assessed and provided with funding support to conduct the research. This was done to evaluate the behaviour and result component of the capacity building as suggested by Kirkpatrick and Kirkpatrick (2009).

A quasi-experimental nonequivalent control group design with a single group time-series design was employed to identify differences in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program.

One-to-one interviews with mentees were conducted to have an in-depth picture of early career researchers' perspectives on the implemented mentoring program and support required for them.

Sample

The study participants comprised a total of 12 early-career researchers affiliated with the universities of the Western region of Kazakhstan. Table 1 presents the participants background and demographic information.

Table 1

Participants' Information

Rs	Age	Gender	Place of work, City	Education	Research Direction	Work Experience
R1	36	Female	K. Zhubanov Aktobe Regional University, Aktobe	MSc, PhD candidate	Social Sciences and Humanities	15
R2	28	Male	M. Utemisov West Kazakhstan University, Oral	MSc, PhD candidate	Social Sciences and Humanities	2

R3	37	Female	K. Zhubanov Aktobe Regional University, Aktobe	MSc, PhD candidate	Social Sciences and Humanities	14
R4	25	Female	Kazakh-Russian International University, Aktobe	MSc, PhD candidate	Social Sciences and Humanities	2
R5	31	Female	Baishev Uniersity, Aktobe	MSc	Social Sciences and Humanities	6
R6	32	Female	West Kazakhstan Innovation and Technological University, Oral	MSc, PhD candidate	Technical Sciences	7
R7	37	Male	Kh. Dosmukhamedov Atyrau University, Atyrau	MSc, PhD candidate	Technical Sciences	11
R8	38	Male	M. Utemisov West Kazakhstan University, Oral	MSc, PhD candidate	Technical Sciences	16
R9	38	Male	Zhangir Khan West Kazakhstan Agrarian-Technical University, Oral	MSc	Technical Sciences	8
R10	25	Female	K. Zhubanov Aktobe Regional University, Aktobe	MSc	Social Sciences and Humanities	3
R11	36	Female	Baishev University, Aktobe	MSc	Social Sciences and Humanities	15
R12	33	Female	Baishev Uniersity, Aktobe	MSc, PhD candidate	Social Sciences and Humanities	10

Data Collection

The authors employed a quasi-experimental nonequivalent control group design with a single group time-series design (Shadish et al., 2002) to identify differences in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program. The study participants were given two repeated measures, a pretest survey to obtain the baseline data and a posttest to obtain the follow-up data, to assess the growth of the participants' research capacity by outlining their research engagement and barriers to doing research before and after the intervention (the mentoring program).

Being an effective method in exploring participant thoughts, feelings, and beliefs about a particular topic, one-to-one interviews with 9 mentees were conducted to have an in-depth picture of early

career researchers' perspectives on the mentoring program for building their research capacity – increasing their research engagement practices and decreasing their barriers to doing research.

Research Instrument

The pretest and posttest used the same instrument (a survey with a five-point Likert scale). The survey questionnaire was adapted from Jamoom & Al-Omrani (2021). The scale reliability of the variables was tested by Kuzembayeva, Tashmukhambetov, & Maydangalieva (2023) and demonstrated high reliability Cronbach's Alpha coefficients for Research Engagement Specifics Scale ($a \geq 0.836$; N=120) and Barriers to doing research Scale ($a \geq 0.898$; N=120).

Data Analysis

Participants responded to the questionnaires twice for indicating their research engagement and barriers to conducting research. The descriptive statistics were done to analyze the quantitative research data on the mentees' research skills using SPSS and the Wilcoxon Signed-Rank Test was employed to outline differences in study participants' research engagement and challenges in conducting research before and after the intervention – at the start and end of the mentoring program. Effect sizes were computed using a calculator.

Interviews were carried out by a single researcher and transcribed verbatim. Inductive thematic analysis was used for analyzing qualitative data, coding and categorizing.

Being an effective method in exploring participant thoughts, feelings and beliefs about a particular topic, one-to-one interviews with 9 mentees were conducted to have an in-depth picture of early career researchers' perspectives on the mentoring program for building their research capacity – increasing their research engagement practices and decreasing their barriers to doing research.

Results

1. Effectiveness of the Mentoring Programme for Early Career Researchers in Developing Their Research Capacity

To assess the effectiveness of a mentoring program for HEIs academic staff in developing their research capacity we explored differences in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program.

At the start of the mentoring program, PhD candidates among mentees constituted 50% of all respondents. After a year, two mentees were admitted to the PhD program (66.7%); others who do not study intend to apply in 3-5 years.

The mentees' research engagement frequency at the start (preintervention) and end (postintervention) of the mentoring program is presented in Figure 1.

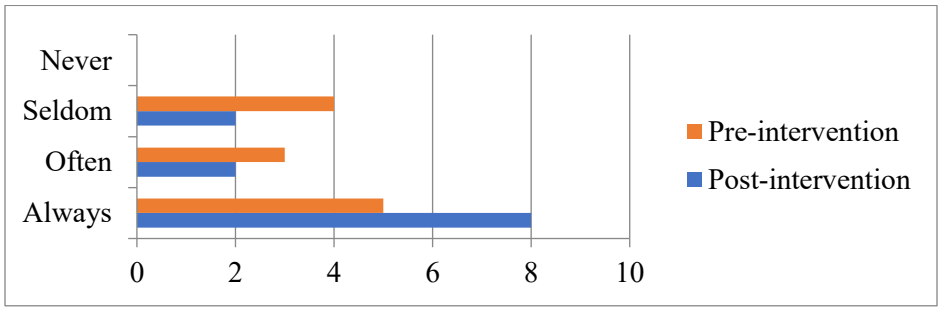

Figure 1. Mentees' Research Engagement Frequency Before and After the Intervention

The pretest results show that 41.7% of mentees are continuously involved in research, whereas the posttest results show a 25% increase in the frequency of research engagement, with 66.7% of mentees involved in research activities on an ongoing basis.

Figure 2 presents mentees' research publication frequency in local and international peer-reviewed research journals.

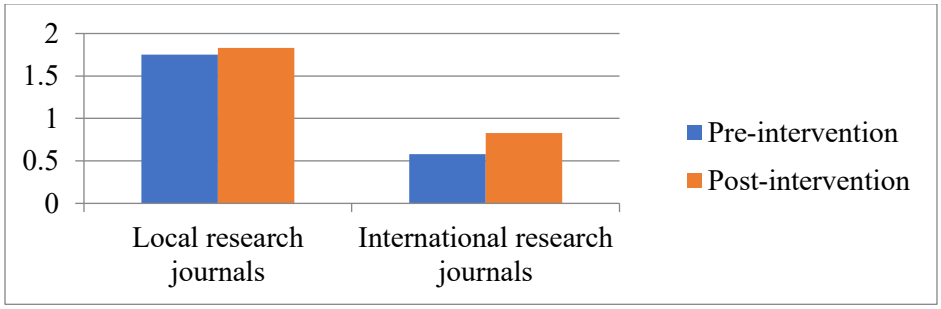

Figure 2. Mentees' Research Publication Frequency before and after the Intervention

The mentees' pretest and posttest mean frequency values of their publication in international research journals indexed in the Scopus database show an increase of 0.3%, while the increase of 0.1% is seen in publishing in local research journals recommended by the Committee for Quality Assurance in the Field of Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan. This is because local journals require an even longer publication process than do international ones. During the mentoring program all mentees

conducted research in their fields under the supervision of a personal mentor (authors) and submitted their research articles to peer-reviewed journals.

A Wilcoxon signed-rank test was employed to compare the research engagement and barriers to conducting research of early career researchers accepted to the mentoring program at the start and end of intervention. Table 2 presents the study participants' research engagement scores before and after the intervention of mentoring program.

Table 2

Research Engagement Scores Before and After the Intervention

Research attitudes	Ranks	Descriptive Statistics			Wilcoxon Test	
		N	Mean Rank	Sum of Ranks	Z	p
I conduct research because it is good for my professional development	Negative Ranks	1	4.50	4.50	-2.12	0.03*
	Positive Ranks	7	4.50	31.50		
	Ties	4				
I conduct research because it enhances my teaching skill	Negative Ranks	1	4.00	4.00	-2.31	0.02*
	Positive Ranks	8	5.13	41.00		
	Ties	3				
I conduct research because it will help me get the promotion	Negative Ranks	1	3.50	3.50	-1.90	0.06
	Positive Ranks	6	4.08	24.50		
	Ties	5				
I conduct research to promote my self-confidence as a teacher	Negative Ranks	0	0.00	0.00	-2.25	0.02*
	Positive Ranks	6	3.50	21.00		
	Ties	6				
I conduct research to become more critical and analytical about my teaching practices	Negative Ranks	0	0.00	0.00	-2.64	0.01*
	Positive Ranks	8	4.50	36.00		
	Ties	4				
I conduct research to develop my research skills	Negative Ranks	2	4.00	8.00	-1.51	0.13
	Positive Ranks	6	4.67	28.00		
	Ties	4				
	Negative Ranks	0	0.00	0.00	-2.53	0.01*

I conduct research to raise my awareness of my students' needs	Positive Ranks	7	4.00	28.00
	Ties	5		

[*] *significant at p<0.05*

There were statistically significant differences in the mentees' research engagement scores before and after the intervention of mentoring program.

The Wilcoxon signed-rank test showed that the early career researchers' level of perceived research engagement increased because it is good for their professional development from pre-program (Md = 4.00) to post-program (Md = 5.00; W = 4.50, z = -2.12, p < .03, r = 0.74); because it enhances their teaching skill from pre-program (Md = 4.00) to post-program (Md = 5.00; W = 4.00, z = -2.31, p < .02, r = 0.87); to promote their self-confidence as a teacher from pre-program (Md = 4.00) to post-program (Md = 5.00; W = 0.00, z = -2.25, p < .02, r = 0.87); to become more critical and analytical about their teaching practices from pre-program (Md = 4.00) to post-program (Md = 5.00; W = 0.00, z = -2.64, p < .01, r = 1.02); to raise their awareness of their students' needs from pre-program (Md = 4.00) to post-program (Md = 4.50; W = 0.00, z = -2.53, p < .01, r = 1.02). Thus, the intervention had a statistically significant effect on scores with effect sizes from moderate to large.

The study participants' research barriers scores before and after the intervention of mentoring program are presented in Table 3.

Table 3

Research Barriers Scores before and after the Intervention

Barriers	Ranks	Descriptive Statistics			Wilcoxon Test	
		N	Mean Rank	Sum of Ranks	Z	p
I do not have time to conduct research	Negative Ranks	4	2.50	10.00	-1.86	0.06
	Positive Ranks	0	0.00	0.00		
	Ties	8				
I do not have access to the books and journals I need	Negative Ranks	5	3.70	18.50	-0.79	0.43
	Positive Ranks	2	4.75	9.50		
	Ties	5				

My employer does not support me in researching	Negative Ranks	6	3.58	21.50	-0.50	0.62
	Positive Ranks	2	7.25	14.50		
	Ties	4				
I do not have enough knowledge and skills required to conduct quality research	Negative Ranks	5	3.40	17.00	-1.38	0.17
	Positive Ranks	1	4.00	4.00		
	Ties	6				
Nothing motivates me to execute research	Negative Ranks	7	4.79	33.50	-2.23	0.03*
	Positive Ranks	1	2.50	2.50		
	Ties	4				
I need mentoring from professionals having experience in research, yet no one is available	Negative Ranks	8	6.50	52.00	-1.71	0.09
	Positive Ranks	3	4.67	14.00		
	Ties	1				
It is difficult to get my research published, so others cannot benefit from its findings	Negative Ranks	8	4.75	38.00	-1.89	0.06
	Positive Ranks	1	7.00	7.00		
	Ties	3				
The learners and other teachers would not cooperate if I asked for help	Negative Ranks	8	4.50	36.00	-2.64	0.01*
	Positive Ranks	0	0.00	0.00		
	Ties	4				
There is nothing worth researching in our work	Negative Ranks	6	5.00	30.00	-1.73	0.08
	Positive Ranks	2	3.00	6.00		
	Ties	4				
I am not interested in researching as I believe my job is to teach, not to execute research	Negative Ranks	6	4.17	25.00	-1.93	0.053
	Positive Ranks	1	3.00	3.00		
	Ties	5				

* significant at $p<0.05$

The table shows a decrease in the early career researchers' research barriers such as the lack of motivation to conduct research from pre-program (Md = 3.00) to post-program (Md = 2.00; W = 33.50, z = -2.23, $p < .03$, r = -0.81) and the lack of cooperation between learners and teachers from pre-program (Md = 4.00) to post-program (Md = 3.00; W = 36.00, z = -2.64, $p < .01$, r = -0.96). Thus, the intervention had a statistically significant effect on scores with effect sizes from moderate to large.

The results show that the null hypothesis (H_0: There is no statistically difference in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program) was rejected and the alternative hypothesis (H_1: There is a statistically difference in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program) was accepted.

Mentors' assessment of the mentees' R&D on their chosen topic, research publications based on their reports on completed work showed the successful execution of the mentoring program. All mentees received payments for their R&D on the basis of the supporting documents provided by them.

2. Early Career Researchers' Perspectives on the Mentoring Program and Support Required for Them

Interviews with mentees were conducted to explore their thoughts, feelings and beliefs about the mentoring programme. Eight themes emerged from the interviews and are presented in Table 4.

Table 4

Themes and Sub-Themes Derived from the Thematic Analysis of Interview Data with the Program Mentees

Major Themes	Sub-Themes	Respondents
Goals for undertaking research	Writing and defending a PhD thesis	R1, R3, R8, R12
	Investigation of relevant issues	R4, R5, R8, R10
	Knowledge formation and expansion	R5, R6, R11
	Solving urgent problems	R5, R10
	Obtaining skills for independent research	R8
	Writing and publishing research articles	R6
Difficulties in conducting research	No access to the scientific literature, resources and equipment	R5, R6, R10
	Analyzing research data	R1, R4, R6
	Lack of research funding	R6, R8, R10
	Discrepancy between domestic and international research	R3
	Lack of appropriate environment	R5
	Lack of time	R6
	Lack of research expertise and skills	R6
	Applying for research funding	R10
	Publication in WoS and Scopus indexed journals	R12
Institutional support required	Offering research scholarships and awards, funding research projects	R4, R5, R8
	Training on research	R1, R6, R11
	Advising on conducting research and publishing	R4, R6, R12
	Reducing teaching load and social work of academic staff	R3, R5
	Providing access to laboratories and libraries	R6, R10

	Funding and organization of conferences	R6, R10
	Establishing collaboration between the scientific sector and industries to implement research results	R8
State support required	Allocation of more research grants	R4, R6, R11, R12
	Offering research programs and scholarships	R4, R6, R8
	Creating scientific networks and communities	R6, R8
	Access to educational programs and courses on research	R6, R10
	Reducing teaching load and social work of academic staff	R1
	Providing housing for young researchers	R8
	Providing advanced research infrastructure	R10
Advantages of the mentoring program	Personal development and growth	R6, R8, R11, R12
	Writing and publishing research articles	R1, R3, R12
	Mentors' individual consultations	R1, R5, R6
	Sharing research experiences	R4, R10, R12
	Financial support	R3
	Increasing interest in conducting research	R5
	Writing and publishing research articles	R1, R4, R6, R10, R12
Research skills gained by mentees	Analytical skills	R6, R8, R11
	Critical thinking	R6, R11
	Research planning	R8, R10
	Problem solving skills	R5
	Preparing grant proposals for research funding	R3
	Development and application of research methodology	R6
	Time management	R10
Mentor's professional and personal qualities	Knowledge and experience	R1, R3, R4, R6, R8, R10, R12
	Open to share knowledge, skills, and experience	R6, R10, R11, R12
	Communicative and friendly	R4, R5, R6, R8
	Empathetic and supportive	R6, R10
	Striving for continuous development and growth	R1, R6
	Flexible	R6, R8
	Oratory skills	R3
	Knowledge of English	R3
Evaluation of program and mentors	Program evaluation	R1-R12
	Shortcomings of the program	R1, R5, R8
	Evaluation of mentors	R1-R12

2.1. Mentees' Goals for Undertaking Research

Results indicate that early career researchers engaged in the mentoring program are aimed at obtaining PhD, for which they need skills of conducting and publishing research.

"*My goals are conducting graduate research, obtaining skills for independent research activities, and practicing research*." (R8)

"*I want to publish research results in scientific journals or present at conferences for the exchange of knowledge and experience*." (R6)

Mentees are interested in expanding their knowledge and research skills to independently explore relevant issues and solving practical research problems.

"*The main purpose of research is to expand our knowledge and understand the world around us*." (R6)

"*My goal is the formation of new knowledge and solving urgent problems through research within my direction*." (R5)

"*My goal in conducting scientific research is to achieve new knowledge that is reliable and scientifically based*." (R11)

"*Researching new knowledge in your field, contributing to the development of science and education, supporting innovation and solving urgent problems*." (R10)

2.2. Difficulties Faced by Mentees in Conducting Research

Only one out of nine mentees stated no challenges in conducting research. Others admit that they face difficulties in conducting research such as limited access to scientific literature and an appropriate equipment for doing research at their universities, lack of time due to the excessive workload, no research funding, and lack of research expertise and skills especially in analyzing and processing data.

"*Difficulties in conducting scientific research are the lack of literature and lack of an appropriate environment*." (R5)

"*The problems in conducting research are limited access to resources, difficulties with financing, lack of time, difficulties with accessing or analyzing data, as well as the need for an extensive amount of expertise and skills*." (R6)

"*One of the main difficulties is getting research funding, as well as limited resources and equipment*." (R10)

Mentees are, moreover, challenged by the need to publish in international peer-reviewed journals and to compete for research funding.

"*Publication of articles indexed in the Web of Science and Scopus indexed journals*." (R12)

"*The need to compete for grants is also a challenge*." (R10)

2.3. Institutional Support Required for Early Career Researchers

According to mentees, HEIs should organize research training and mentoring offered by the experienced researchers.

"*HEIs should organize courses or training seminars on research methodology*." (R1)

"*We need training and skills development: Providing opportunities for professional development, including courses, seminars and trainings on research methodology, publishing and scientific communication*." (R6)

"*Universities can support young researchers by organizing more experienced researchers' assistance and recommendations in conducting research*." (R4)

"*Early career researchers need assistance in writing research articles, reports and presentations, as well as in processing research results*." (R6)

Mentees state the importance of providing networking opportunities at the institutional level and establishing partnerships with industries.

"*Creating opportunities for knowledge sharing, collaboration and communication with other researchers and scientific communities is as well important*." (R6)

"*Ensuring the connection between the scientific sector and real industries where research results will be implemented*." (R8)

Early career researchers would like to get institutional research funding and access to research laboratories with up-to-date equipment and current research literature.

"*Providing access to laboratories, libraries, databases and specialized equipment is necessary for research*." (R6)

Academic staff at Kazakhstani HEIs are challenged by the excessive teaching workload and social work such as teachers' duty in the dormitory, supervision of students' groups, organization of extracurricular activities and preparation of department's documents. To conduct research mentees would like the teaching load and social obligations at the university to be reduced.

"*Reducing teaching load and social work of young researchers is required to develop effectively and achieve their goals in research activity*." (R3)

2.4. State Support Required for Early Career Researchers

Early career researchers emphasize the value of providing financing possibilities to HEI academic staff in relation to state support.

"*Allocating more grants, as well as scientific programs for young researchers is needed in order to ensure accessibility for research.*" (R4)

"*Grants and scholarships help young researchers cover the costs of research, publications and participation in conferences*." (R6)

The mentees outline the benefits of scientific networks and communities for early career researchers in fostering their research activities.

"Participation in scientific conferences, seminars and discussions facilitates the exchange of knowledge and experience between researchers." (R6)

Early career researchers consider advanced research infrastructure and training significant for maintaining high standard.

"Access to educational programs and courses on research methodology, data analysis, scientific writing and other aspects of scientific work will help young researchers develop their skills." (R6)

"*The infrastructure for research and training programs helps to strengthen research activity*." (R10)

2.5. Benefits of the Mentoring Program for Mentees

Mentees state the advantages of individual consultations of program that are very helpful and provide expert guidance in conducting research.

"*Individual consultations of mentors at various stages of research are very helpful for young researchers.*" (R1)

"*The effective aspects of the program: guide young professionals, increase their interest in conducting research, and guide them in solving obstacles in research activities*." (R5)

"*Mentoring offers (1) professional development to mentees by providing access to a mentor's experience and knowledge, which helps to develop professional skills; (2) feedback and support: a mentor can give constructive feedback on your work and help you overcome difficulties on the way to achieving goals; (3) self-awareness: regular meetings with a mentor can help you better understand your strengths and weaknesses, which promotes self-awareness and personal growth*." (R6)

"*Within the framework of the mentoring program, methodological and financial support was provided for the publication of articles in peer-reviewed scientific journals*." (R3)

Under the mentorship program, mentees were trained in writing research articles that followed the format of IMRAD, or Introduction, Methods, Results, and Discussion.

"*The main benefit of the mentoring programme for me is the assistance in writing a research article on the IMRAD structure for publication in the journals indexed in the international citation databases Web of Science (Clarivate Analytics) and Scopus (Elsevier) and recommended by MSHE RK*." (R1)

"*The features of modern research work are explained*." (R3)

"*The program offered support and advise to young scientists when writing research papers and choosing a scientific journal for publications*." (R12)

Mentees admit that the mentoring program facilitates personal development and growth.

"*By participating in this program, I started planning, which gave me goals and efficiency for growth*." (R8)

"*This program helps young people to engage in research freely and develop personally*." (R11)

"*The value of the mentoring program is the continuous learning and growth in the chosen direction*." (R12)

Mentees were given regular opportunities to *share* their *experiences* with *researchers* and get feedback.

"*Personally, in my perspective, mentoring has played and still plays a key role providing advice and experience exchange, as well as offering the necessary resources for young researchers*." (R10)

"*The benefit lies in transferring the vast experience of mentors to young researchers in the field of research activity*." (R4)

"*Conducting weekly training seminars were helpful in facilitating the sharing of researcher experiences*." (R12)

2.6. Research Skills Gained by Mentees as a Result of the Mentoring Program

Early career researchers report increased research knowledge and abilities as a result of the program, which led to the successful publication of their research findings.

"*I mastered the skills of structuring the data and processing the text, making research results into a research article, communicating with the editorial board of the journal*." (R1)

"*I learned how to write a scientific article unambiguously*." (R5)

"*The feedback from a mentor helps to improve scientific writing skills and structuring research papers*." (R6)

"*Mentoring has improved my skills in research planning, writing research articles, and time management*." (R10)

"*As a result of participating in the mentoring program, my knowledge in the field of problem research and the design of research results has increased, as well as the quality of my scientific publications has significantly improved*." (R4)

"*Mentoring helps to develop skills in the development and application of research methodology*." (R6)

"*The quality of scientific papers has improved*." (R12)

Mentees declare the increase of their analytical, critical thinking, problem solving skills. Moreover, the mentoring program developed their skills of preparing research proposals.

"*A mentor can help improve the ability to analyze data and identify key trends in scientific research.*" (R6)

"*Mentoring promotes the development of critical thinking and the ability to self-criticize during research*". (R6)

"*As a result of the mentoring program, I have improved critical thinking and analytical skills through experiential learning*." (R11)

"*As part of the training program, I learned how to solve obstacles during research work*." (R5)

"*I gained skills in developing a research project for a competition for grant funding*." (R3)

2.7. Mentor's professional and personal qualities

Regarding personal and professional qualities that mentors should possess, mentees emphasize the importance of mentors' knowledge and expertise, as well as their willingness to constantly progress.

"*The mentor must be aware of the latest discoveries and changes in science, know a foreign language, and have oratory skills that will appeal to the audience*." (R3)

"*The mentor must have experience in the field of research, be open to the exchange of knowledge, be patient and ready to support the development of the mentee*." (R10)

"*A mentor should be willing to constantly update knowledge and skills in order to be a relevant and in-demand mentor*." (R6)

"*Organizational skills, continuous training, and professional growth are important for mentors.*" (R1)

However, in addition to being informed and skilled in research, a mentor should be communicative and friendly, flexible, empathetic and supportive.

"*Highly educated, experienced, conscientious, tactful, and friendly.*" (R4)

"*Able to show a positive behavior pattern and react quickly in time*." (R5)

"*A mentor should be able to accept different points of view and be flexible in adapting to the individual characteristics of a mentee*." (R6)

"*Communicative, educated, flexible and with a sense of humor*." (R8)

2.8. Evaluation of the Mentoring Program and Mentors by the Mentees

All of the mentees were highly satisfied with the mentoring program and scored it 9.7 on a 10-point scale.

"*The program provided assistance in unlocking the research potential of young researchers, offered career opportunities, and financial support in the form of bonuses for work performed*." (R1)

"*Comprehensive work has been carried out to acquire the skills necessary for modern research*." (R3)

"*I was able to establish a free, trusting relationship and work with each mentor individually while receiving support*." (R5)

"*Every week, researchers shared their experience and knowledge, thanks to which young peers improved the quality of writing their research papers, published in peer-reviewed journals, someone defended a PhD thesis, enrolled in doctoral studies, etc*." (R12)

Mentees suggested writing collaborative research publications and research proposals.

"*8 points, the program is clear, interesting and relevant. It increases the potential of young scientists and stimulates the writing of an article. I think it would be good to add writing joint scientific articles and preparing scientific projects*." (R8)

Early career researchers have generally highlighted the value of mentoring programs in developing research capacity, which is highly beneficial for novice researchers.

"*Participation in the mentoring program is necessary for every future scientist and young researcher in the development of research skills, and the mentoring program in which I took part is able to help everyone to acquire such skills*." (R4)

"*Programs of this kind are necessary and very useful for young scientists*." (R12)

Some of the mentees acknowledged that they would benefit from more instruction in text editing and data analysis software for research publications, self-analysis, and understanding the challenges mentors have when conducting research.

"*I would like more information about applications to help me write a research paper (text editing, data analysis, etc.)*" (R1)

"*There wasn't much discussion of the challenges mentors faced in their experience*." (R5)

"*I wanted more training on how to conduct self-analysis of research*." (R8)

Mentees scored the program mentors 9.9 on a 10-point scale.

"*I believe that mentors have done and continue to do a great job, and their help to young researchers is invaluable*." (R10)

"*My score is 10 points, because mentors, in my opinion, have made a huge contribution to the success of each mentee*." (R4)

"*10 out of 10 points, because the mentor paid individual attention to each mentee and considered in detail the way out of the obstacles in the research work and directed the process of publications by providing explanations and reflecting on the current points of research work*." (R5)

"*9, Professionals in their field, completed the tasks set for the project*." (R8)

"*They deserve 10 points for their contribution to the development of young researchers and they have already made a great contribution by creating a mentoring project*." (R10)

"*I give a high score of 10 points, because the mentor conducts the ongoing professional work with the mentee and the mentor identifies obstacles and discusses their solutions with the mentee.*" (R11)

Discussion

The study aimed at exploring the effectiveness of a mentoring program for HEIs academic staff in developing their research capacity the mentees' perspectives on it. The study backs up Tammam et al.'s (2024) conclusion that the findings will encourage leaders in higher education to invest in capacity building in order to boost research productivity and performance.

The study results showed that the mentoring program allowed early career researchers to foster their research engagement and increase their research publication frequency. Consistent with Canavan et al. (2009), the results demonstrate that research dissemination via publications and

presentations is a reliable indicator of the impact of the capacity-building program. In line with Varshney et al. (2016), stating that collaborations help increase research capacity, joint activities of mentors and mentees withing the mentoring program were effective in developing early career researchers' research capacity.

The Wilcoxon signed-rank test was conducted to compare research engagement and barriers to conducting research of early career researchers accepted to the mentoring program at the start and end of intervention. There were statistically significant differences in the mentees' research engagement scores and the perceived barriers to conducting research before and after the intervention of mentoring program. As a result of the mentoring program, mentees' challenges in conducting research significantly decreased. Thus, we rejected the null hypothesis (H_0: There is no statistically difference in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program) and accepted the alternative hypothesis (H_1: There is a statistically difference in mentees' research attitudes and challenges in conducting research before and after intervention – at the start and end of the mentoring program).

The results of the interviews conducted with the program mentees showed that most of the early career researchers were engaged in the mentoring program for writing and defending a PhD thesis, investigation of relevant issues, and overall knowledge formation and expansion. Difficulties they encountered in conducting research included no access to the scientific literature, resources and equipment, challenges in analyzing research data, and the lack of research funding.

Mentees declared that they need support at the institutional and state levels. To assist early career researchers in their research endeavors, they recommended offering research grants and scholarships, funding research initiatives, training in research, counseling on conducting research, and publishing.

Moreover, interviews demonstrated the early career researchers' need for housing in line with previous studies (Youth Voice in Housing Associations, 2024), stating that young people are generally in a difficult position to buy, to rent or to have access to housing. The need of young researchers in housing has been recently addressed by the government initiative in Kazakhstan. In December 2023, Ministry of Science and Higher Education of the Republic of Kazakhstan launched a program to provide housing for young scientists in cooperation with Otbasy Bank JSC (Housing programme for young scientists and its implementation at Abai University, 2014).

Early career researchers saw their personal development and growth, writing and publishing research articles, mentors' individual consultations, and the opportunity to share experiences as the advantages of the mentoring program. They stated that the mentoring program allowed them to develop analytical skills, critical thinking, and research planning.

All mentees agreed that research mentors should be knowledgeable and experienced, open to share knowledge, skills, and experience. However, besides professional skills, mentors should possess personal qualities such as communicativeness and friendliness towards mentees.

Researchers agree that evaluation of mentoring program and mentor effectiveness may be best pursued by seeking insight from the immediate beneficiaries – the mentees (Behar-Horenstein et al., 2019). All of the mentees were highly satisfied with the mentoring program and scored it 9.7 on a 10-point scale. They stated the contribution of the mentoring program to early career researchers' knowledge and skills development. Mentees improved the quality of writing their research papers, published in peer-reviewed journals, some of them defended a PhD thesis, others enrolled in doctoral studies. The program offered mentees career opportunities, and financial support in the form of bonuses for work performed.

The program mentors were scored 9.9 on a 10-point scale for their knowledge and experience shared with mentees contributing to mentees' research capacity building. Mentees admitted that the program mentors had done a great job and hoped they would continue supporting young researchers. Given its success, we feel the mentoring program could become a national model in line with previous studies (Pfund et al., 2015) for fostering research engagement of HEIs academic staff and building their research capacity.

The study's findings provide a solid foundation for discussions and initiatives pertaining to the development of research capacity. In accordance with Tammam et al. (2024), these can have implications outside of our particular context, so longitudinal studies are strongly encouraged to investigate and monitor the effectiveness of research capacity building strategies over time.

Conclusion and Recommendations

The present study aimed to investigate the effectiveness of the mentoring program for HEIs academic staff in developing their research capacity and the mentees' perspectives on it. The results showed that the early career researchers' level of perceived research engagement increased

from pre-intervention to post-intervention of the mentoring program for early career researchers' research capacity building because it is good for their professional development, it enhances their teaching skill, promotes their self-confidence as a teacher, allows them to become more critical and analytical about their teaching, and raises their awareness of their students' needs.

The early career researchers' scores of research barriers (such as the lack of motivation to conduct research and the lack of cooperation between learners and teachers) decreased from pre-intervention to post-intervention. The statistically significant effect of the intervention on scores allowed to reject the null hypothesis and accept the alternative hypothesis.

The interviews with the program mentees outlined their overall positive perspectives on the mentoring program, which was scored it 9.7 on a 10-point scale. The mentoring program allowed them to develop analytical skills, critical thinking, and research planning. The program mentors received 9.9 on a 10-point scale because of the information and experience they shared with mentees, which helped them develop their research capacity. The program mentors had done an excellent job, according to the mentees, and they hoped that they would continue to assist upcoming researchers.

The traditional outcomes of research capacity building measurement include publications in peer reviewed journals and conference presentations. Scholars concur that we should go beyond these results to fully understand the social influence of research and fostering "professional skills" like critical thinking, etc. The proposed model of mentoring program provides evidence to link process of research capacity building to its outcomes for early career researchers. The program mentees will eventually be able to conduct and share top-notch research in an efficient, effective, and increasingly independent manner.

We hope that the research findings create a body of knowledge that will influence higher education and science, and the practice of research capacity building. We believe that the mentoring program, given its effectiveness, has the potential to become a national model for encouraging academic staff at HEIs to engage in research and developing their research capability.

The actualization of the problem of research capacity building of early career researchers is associated with the search for new more effective mechanisms for its disclosure. The authors suggest using mentoring as such a mechanism. The new mechanism developed by the authors is designed to provide active assistance in unlocking the scientific potential of HEIs academic staff in their early research career, which will allow this additional measure to take a special place

among other measures of state and university support. The uniqueness of the authors' mentoring model lies in the fact that early career researchers can participate in its implementation, who are at the stage of long-term preparation for admission to the PhD program and at the same time short-term planning of a scientific career. It should be noted that this category most of all needs a separate mentoring program, as evidenced by its high demand, which is only growing in regional universities of the Republic of Kazakhstan. The mentoring program for HEIs academic staff in developing their research capacity was implemented in regional universities of Western Kazakhstan. We propose researching the effectiveness of the mentoring program in other regions of the country and exploring the perspectives of the early career researchers on it.

While this study provides valuable insights, there are some limitations regarding the sample and data. The data on the research capacity and mentees' perspectives on the mentoring program were collected through self-perceived questionnaire surveys and interviews, which may have led to superficial responses from mentees. However, to mitigate this limitation, mentors' assessment based on mentees' reports on the completed works, research engagement and research publications was conducted, indicating the validity of the data.

The importance of the research results currently obtained is to prevent an acute shortage of mature high-level researchers with successful research careers in Kazakhstani universities in the next 10 years. The expected effects will manifest themselves in the emergence of the institute of mentoring in regional universities of the Republic of Kazakhstan and in creating prerequisites for the development of scientific schools.

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