

BARRIERS TO RESEARCH COMPETENCY DEVELOPMENT IN DOCTORAL EDUCATION: A QUALITATIVE EXPLORATION

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Abstract

One of the major goals of the doctoral program is to develop research competency to enable scholars to conduct independent, ethical, and high-quality research. But numerous doctoral students have difficulties in cultivating these abilities. In this study, the authors went into the doctoral scholars' understanding of research competency, factors that help in developing research competency, factors that hinder in developing research competency, coping strategies and suggestions to strengthen the competency development. The study used a qualitative exploratory design with a small number of five doctoral scholars from Pakistani universities who were interviewed using semi-structured interview method. The data were analyzed by reflexive thematic analysis. Five themes emerged conceptualizing research competency, pathways to competency development, barriers, coping strategies and recommendations. They found that research competency goes beyond method knowledge to critical thinking, academic writing, ethical research practices, resilience, and life-long learning. The personal responsibilities, challenges of supervision, lack of institutional support, and lack of research opportunities were identified as significant obstacles. These challenges were overcome through self-directed learning, collaborative work with peers, sufficient use of time and the positive application of feedback from scholars. It suggests continued research training, proper research practices, mentoring, more funding for research and better research cultures to support doctoral scholars. The results offer practical implications to universities and policy makers regarding enhancement of doctoral education and competency development of research.

Introduction

Doctoral education is the highest and most important level of academic training and is the foundation of the next generation of researchers who can create new knowledge and solve complex societal challenges. It is now expected that doctoral graduates have high-level research skills that will enable them to plan complex research, critically assess evidence, address complex research problems and communicate their results in a

scholarly manner. As a result, research competency has emerged as one of the key measures of the quality of doctoral education and is a necessary foundation for academic and professional success. In addition to the methodological knowledge, the doctoral scholars are expected to learn and apply critical thinking, research ethics, academic writing, project management, collaboration and life-long learning skills all of which would make them effective

independent researchers (Tas et al., 2023). Research competency is a multi-dimensional concept that includes knowledge, technical skills, cognitive skills, professional attitudes and personal attributes that enable the conduct of good research. The cultivation of these skills does not just happen in the classroom but continues throughout the lifespan of engaging in research pursuits, with supervisors, in academic communities, and in reflective learning experiences. Doctoral education is a developmental process, in which academics progressively move from being consumers of knowledge to its independent producers. This transformation demands ongoing academic support, positive supervision, and chances for engaging in real research settings that cultivate intellectual development and occupation identity (Pyhältö et al., 2022).

Research competence is an important key competency of doctoral education, but evidence indicates that many doctoral scholars struggle to develop the skills required for their success as researchers. Being a doctoral student means making method decisions, dealing with research uncertainty, publishing in competitive research disciplines, and having a number of academic and personal demands. Lack of research training, bad practice among supervisors, limited institutional resources, lack of research funding and high publication expectations are some of these challenges that are often exacerbated. These barriers can include delays in graduation, limits to research productivity, a loss of research confidence, and a negative impact on research scholars' academic experiences overall (Corcelles-Seuba et al., 2023). The doctoral supervision has emerged as one of the most influential factors for the development of competency in research. Good supervisors support the process of research learning by offering timely feedback, methodological guidance, intellectual mentorship, emotional support and assisting doctoral scholars to be part of broader research communities. Good supervision also promotes collaborative research, conference participation, scholarly writing and professional networking, which all play an

important role in competency development. On the other hand, poor supervision, vague goals and objectives, lack of communication, and little mentoring can slow down doctoral scholars' academic growth and create a lack of opportunities for them to develop independent research skills (Chugh et al., 2022; Pyhältö et al., 2022). Research self-efficacy is an emerging key factor in doctoral research success, beyond the support of a supervisor. Self-efficacy in research is the belief that one has the ability to engage in research related activities, including defining research problems, searching literature, selecting research methods, gathering and analysing data, and disseminating research results. Higher research self-efficacy is associated with higher persistence, resilience, creativity and willingness to perform complex research tasks among doctoral students. Apart from personal abilities, the environment, such as supervisory relationships, peer support, institutional culture, and chances for research engagement, also affect the development of research self-efficacy (Sunal & Kemer, 2022; Tas et al., 2023).

Recent studies also highlight the role of institutional learning context on the research competency of doctoral scholars. Structured research training, interdisciplinary collaboration, research resources (digital), funding opportunities, and active scholarly communities are all conditions that foster competency development in universities. Doctoral scholars gain expertise in methodology and acquire communication, networking and leadership skills for academic careers through their participation in Seminars, Workshops, Collaborative Projects and Academic Conferences. Additionally, being involved in supportive research communities has been found to positively affect motivation, low levels of experience of isolation, and overall doctoral experiences (Corcelles-Seuba et al., 2023; Masood et al., 2023).

The present study aims to fill the void by examining the understandings of research competency of doctoral scholars, the factors that promote and constrain research competency development, and how scholars confront

challenges they face in their research process and develop competencies in response. This study foregrounds the voices and experiences of doctoral scholars, and provides evidence-based insights for supervisors, higher education institutions and higher education policy makers who want to enrich their doctoral research training or improve its quality.

Research Objectives

The objective of this research is to:

- discuss the understanding of research competency of doctoral scholars from the perspective of doctoral education.
- examine the enablers and the barriers in the effectiveness of the development of research competency among doctoral scholars.
- understand challenges faced by doctoral scholars on their research journey.
- come up with tangible suggestions and ideas for improving the building-up of research competency development in doctoral studies.

Research Questions

RQ1: What are the meanings and conceptualizations of research competency by doctoral scholars in the course of doctoral training?

RQ3: What are the factors that support and impede the competence of research skills of doctoral scholars?

RQ3: What are the reactions and coping mechanisms of doctoral scholars towards the challenges they face during the process of developing competency in research?

RQ4: What the doctoral scholars recommend to boost the competency development in research during doctoral studies?

Significance of the Study

This study further builds on the existing literature about doctoral education by offering deep insights into the process of building up research competency of a doctoral scholar and the challenges they may face along the way. The study

identifies research competency as an extension beyond methodological knowledge and involves critical thinking, ethical practice, independent research and professional attributes such as resilience and lifelong learning, through qualitative exploration. The findings provide useful practical suggestions to universities, doctoral supervisors and policy makers about personal, supervisory, institutional and environmental factors affecting the development of research competency. They also point to some recommendations for the enhancement of doctoral education: continuous research training, effective supervision, supportive research environment and structured mentoring programs. The integration of the experiences of the doctoral scholars and practical recommendations are a proof of the study which can be used to design doctoral programs and institutional policies to improve development of research competency and quality of doctoral education.

Methodology

Research Design

The study used a qualitative exploratory research design to explore the obstacles affecting the development of research competency of the doctoral scholars. A qualitative approach was deemed suitable as it aimed to gain insight into the lived experiences, perceptions and interpretations of the participants about the factors that support or impede the development of research competencies during a doctoral program. Qualitative research allowed for an exploration of the participants' perspectives and experiences in-depth, beyond what could be achieved through quantitative measures, as research competency development is influenced by individual experiences and institutional contexts. Reflexive thematic analysis was used as a qualitative approach in this study, which is a method that was proposed by Braun and Clarke (2006, 2021). This allowed for the systematic recognition, analysis and interpretation of patterns in interview data and allowed for flexibility in the understanding of the participants' experiences in their educational context.

Research Setting and Participants

The study has been done on the doctoral scholars of universities in Pakistan. Participants were chosen because they were currently doing their doctorate and had first-hand experience in building their research skills during their PhD. The sampling technique used was purposive sampling to select information-rich participants

able to give detailed information on the phenomenon being studied. The number of five doctoral scholars was selected based on the qualitative exploratory research. Despite the small sample size, it was sufficiently large for in-depth exploration of participants' experiences and for the thematic analysis to yield rich data.

Table 1. Participant Profile

Participant	Gender	Discipline	Stage of PhD	Research Experience
P1	Male	Social Sciences	Final Year	Published articles and conference presentations
P2	Female	Education	Final Year	Journal publications
P3	Male	Statistics	Mid-stage	Quantitative research experience
P4	Female	Management Sciences	Final Year	Conference presentations
P5	Male	Engineering	Mid-stage	Research projects and publications

Participant identities were anonymized using participant codes (P1–P5) to ensure confidentiality.

Data Collection

Semi-structured interviews were used to gather data, which gave the participants the opportunity to describe what had happened in detail, and to probe new themes that arose. An interview guide was developed based on the literature on doctoral education, research competency, and researcher development. The interview guide covered the following five general topic areas:

▯ Understanding of research competency

▯ Research skills development

▯ The personal and environmental factors that hinder the development of competency

▯ Strategies used to overcome challenges

▯ Recommendations for improving doctoral education

The interviews were conducted with informed consent of participants and lasted about 45–60 minutes. Interviews were recorded and transcribed word for word for analysis.

Data Analysis

Reflexive thematic analysis as proposed by Braun and Clarke (2006, 2021) was used for analyzing interview transcripts. Transcriptions were conducted on the audio-recorded interviews and read several times verbatim to familiarize oneself with the data. Codes were inductively derived from meaningful segments of the transcripts and then clustered into larger categories, which were conceptually similar. The study objectives were explored through various categories which were reviewed and refined iteratively to create coherent themes and subthemes. Themes were continually compared to the original data throughout the analytical process to ensure that they represented participants' experiences. The representative quotations were chosen to depict each theme and to strengthen the findings. The analysis led to five overarching themes:

- (1) Conceptualizing Research Competency,
- (2) Pathways to Research Competency Development,
- (3) Barriers to Research Competency Development,
- (4) Coping Strategies, and
- (5) Recommendations, with nineteen interrelated subthemes.

Table 2. Coding Framework

Initial Codes	Categories	Final Theme
Independent research, research process	Research capability	Theme 1: Conceptualizing Research Competency
Critical thinking, methodology, writing	Research skills	Theme 1
Curiosity, resilience, adaptability	Professional attributes	Theme 1
Coursework	Formal learning	Theme 2: Pathways to Research Competency Development
Reading journals, webinars	Independent learning	Theme 2
Conferences, reviewer comments	Scholarly engagement	Theme 2
Workload, stress	Personal barriers	Theme 3: Barriers to Research Competency Development
Delayed feedback	Supervisory barriers	Theme 3
Funding, workshops	Institutional barriers	Theme 3
Research seminars, collaboration	Research environment	Theme 3
Self-learning	Coping strategies	Theme 4: Coping Strategies
Peer discussion	Coping strategies	Theme 4
Goal setting	Coping strategies	Theme 4
Reviewer feedback	Coping strategies	Theme 4
Continuous workshops	Recommendations	Theme 5: Recommendations
Supervisor training	Recommendations	Theme 5
Conference funding	Recommendations	Theme 5
Research culture	Recommendations	Theme 5
Structured mentoring	Recommendations	Theme 5

Table 3. Themes and Subthemes

Theme	Subthemes
Theme 1: Conceptualizing Research Competency	Independent research capability; Essential research skills; Professional attributes
Theme 2: Pathways to Research Competency Development	Coursework as a foundation; Independent learning; Learning through scholarly engagement
Theme 3: Barriers to Research Competency Development	Personal barriers; Supervisory barriers; Institutional barriers; Research environment
Theme 4: Coping Strategies	Self-directed learning; Peer collaboration; Goal setting; Learning from scholarly feedback
Theme 5: Recommendations	Continuous research training; Supervisor development; Increased funding; Stronger research culture; Structured mentoring

Ethical Considerations

The ethics of qualitative research were carefully followed in the study. Detailed information about the aims of the study was provided to the participants and informed consent was obtained before they entered the study. There was complete voluntary participation and respondents could withdraw from the study at any time without repercussion. The identity of the participants was disguised using identification codes (P1-P5) and all the transcribed interviews were kept in a safe. The results have not included any identifying information.

Data Analysis

Theme 1: Conceptualizing Research Competency

The first theme examined the meaning that doctoral scholars gave to research competency. In all responses, respondents consistently identified research competency as a multidimensional phenomenon which includes methodological

knowledge, critical thinking, academic writing, ethical behavior, and independent research. In addition to being knowledgeable, participants identified some of the attitudes that make someone a competent researcher as: resilience, curiosity, adaptability, collaboration and lifelong learning.

Sub theme 1.1: Research Competency as Independent Research Capability

A general theme in the responses was that the ability to do research goes beyond knowing how to do technical research. Participants noted that competency encompasses being able to do rigorous and independent research, from identifying the research problem to disseminating research findings.

Participant 1 said that I believe it is the competency of conducting research from identifying a research problem till dissemination of the findings, which needs to have a mix of theoretical knowledge, methodological expertise, analytical competency, and ethical responsibility.

In the same way, Participant 3 considered research competency to be a blend of knowledge, skills and attitudes, as he said: Research competency is defined as the ability to conduct quality and ethical research independently by means of knowledge, skills and attitudes.

Participant 5 also indicated that independence in research was important, saying: Research competency is defined as the knowledge and skills to undertake quality research independently. The answers to the question reflect a conception of research competency as not only technical skills but rather as a combination of knowledge and skills for research, research methodology, and independent research.

Sub theme 1.2: Essential Research Skills

The participants were consistently able to list a number of core competencies that they felt were essential for doctoral research. The most common competencies identified were critical thinking, research methodology, academic writing, data analysis and literature review.

Participant 2 emphasized that systematic problem solving was important, and added: Research competency is defined as the ability to approach research problems in a systematic way, but it is not just about technical skills—it is also about creativity, curiosity, resilience, and critically assessing evidence.

Similarly, Participant 3 described the skills competent researchers should have as being able to: Involved in the following aspect of research: "To identify meaningful research problems, critically evaluate existing literature, choose appropriate research designs, analyze data accurately and interpret findings logically.

The same goes for participant 5 who also spoke about methodological knowledge, as well as communication and ethical values, indicating that the researcher has multifaceted skills.

Overall, these responses suggest that participants understood research competency as a multifaceted topic comprising of cognitive, methodological, analytical, and communication skills that are needed to produce quality research.

Sub theme 1.3: Professional Attributes of Competent Researchers

The participants felt that in addition to technical skills, doctoral researchers need to have attributes in their personal and professional lives that enable them to succeed in research at a longer-term level.

Participant 2 emphasized: "...creativity, curiosity, resilience..."

While Participant 3 highlighted: "Time management, resilience, teamwork and adaptability are also considered important as doctoral work is a long journey with lots of unintended obstacles." Participant 5 also commented that: It's also important to be curious and always learning,"

The responses indicate that participants viewed research competency as a more than just research skills, but as professional dispositions that help the researcher adjust to research, to work together in a team and to maintain research motivation throughout the doctoral process.

Generally, the participants saw research competency as a dynamic and comprehensive construct, which includes technical competence in research, and professional attitudes and independent scholarly research practices. They did not only think of competency as methodological knowledge, but considered it to be made up of knowledge, critical thinking, ethical behavior, communication, resilience, and lifelong learning. It indicate that we should train doctoral students' competency in technical research and professional development during the whole period of doctoral training.

Themes 2: Pathways to Research Competency Development

The continuous process of research competency development was consistently perceived as a dynamic process that is ongoing and will continue after the formal doctoral coursework. The participants did not consider competency as something that can be learned in the classroom alone, but as something that can be developed by continuous learning, practical research experience, scholarly engagement, reflecting on practice, ongoing interaction with supervisors, peers and the wider academic community. They

said competency develops in a gradual manner as doctoral students face new research challenges, get more specialized knowledge, and are given constructive feedback and engage in scholarly activities. In summary, the results suggest that there are a number of pathways that can be identified for research competency development, all of which lead to the development of competent knowledgeable, independent and confident researchers.

Sub theme 2.1: Coursework as a Foundation.

Participants always said that formal education was the beginning of the development of research skills. They received training in research methodology, statistics, academic writing and research ethics, providing them with basic knowledge necessary to engage in independent research. Participants also said that it was not enough to work on the higher competencies needed in the later stages of doctoral research solely through coursework. Rather, they considered course work as a foundation on which they gained further knowledge and experience.

Participant 1 explained: The research methodology and statistics courses gave me a basic introduction to how to design research, analyze and write academically, but it was when I started conducting my own research that I really learned.

Similarly, Participant 4 stated: I think my understanding of research concepts came from coursework but, during my thesis, it was a completely different learning experience.

These responses indicate that the participants appreciated formal coursework to build up required theory and methodology. They, however, did not see research competency as being fully developed by the use of this competency knowledge in independent research in practice. The results thus show that coursework is seen as the basis, not the end, of competency building.

Sub theme 2.2: Independent Learning

Independent learning was one of the most critical ways of enhancing their research skills, as emphasized by the participants. As the doctoral research unfolds, participants were often faced

with novel statistical tools, research approaches, software programs, and publications that weren't taught during their coursework. As such, they utilized various self-directed learning approaches that included journal articles to read, online learning, webinars, and resources on methodological approaches.

Participant 3 shared: If there was a new research approach that I didn't know before, I would look for online courses, watch webinars and read journal articles until I understood it.

Participant 5 similarly explained: The majority of my learning material was from reading of published research papers and using different analytical techniques on my own.

Participant 2 added: I thought that learning is a continuous process and new methods and technologies are coming up all the time.

Participants' answers reflect their view that independent learning is a key attribute of successful researchers. They were not solely reliant on classroom instruction but were able to identify their learning needs and find the resources they needed to acquire more knowledge and gain research abilities. This autonomous approach fostered a sense of confidence, flexibility, and lifelong learning during the PhD process.

Sub theme 2.3: Learning through Scholarly Engagement

The other pathway that was important to participants was learning through active engagement with the scholarly community. Presenting research at conferences, publishing journal articles, attending research seminars, co-authoring research papers, and reacting to reviewers' comments play an important role in the professional growth and development of research. *Participant 2 reflected: At first, the reviewers' comments to my manuscript were challenging, but they really helped me develop my research design and academic writing a lot.*

Participant 4 explained: Attending conferences helped me to learn about other ideas and feedback that made my research stronger.

Participant 1 similarly stated: Participating in research seminars and talking to seasoned researchers expanded my knowledge of a variety of research methods.

Participant 5 added: Working in a collaboration helped me acquire new research techniques and enhance the overall quality of my research.

These responses suggest that these opportunities for scholarly engagement were beneficial to participants, allowing them to receive expert feedback, exchange ideas, and enhance their research skills. The feedback from reviewers, conference attendees and research partners led the researchers to reflect, think critically and strive for continuous improvement. These experiences were not just class assignments, but opportunities for real learning, both in the skills they were acquiring and their own confidence as professionals.

In general, participants saw research competency development as a complex and dynamic process, which takes place in various complementary ways. The theoretical courses provided the knowledge base needed for research, whilst the independent learning experience allowed gaps in knowledge to be identified and methodological advances to be kept up to date. In addition, the academic activities such as conferences, publications, collaboration and reviewer feedback provided authentic learning experiences which enhanced technical knowledge and professional skills.

The above pathways demonstrate that research competency is a construct that builds as a result of the interaction between structured research education, self-directed research learning, research experience, and engaging in the scholarly community, leading to the independent and competent researcher in the doctoral scholar.

Theme 3: Barriers in the development of research-competency development.

This theme illustrates the different challenges that may hinder doctoral scholars from developing research competencies. The analysis seems to indicate that barriers exist in a variety of contexts, namely in personal, supervisory, institutional and environmental contexts.

Sub theme 3.1 Personal Barriers

Responses from participants indicated that doctoral work and employment and family demands resulted in less time to read, write and conduct research. The other difficulties reported by participants in the long research project were the issues of stress, self-doubt, and low motivation. *Participants 3 emphasized that: I would sometimes come back from research with feeling drained, as I was juggling teaching and research at the same time. I got very critical comments on my manuscript and wondered if I could do any quality research.*

The answers suggest that personal barriers can hinder research productivity because they can constrain research time and emotional capacities to develop competency.

Sub theme 3.2 Supervisory Barriers

Availability of supervisors, delayed feedback and inconsistent guidance were reported by some to have affected the progress of research. Participants appreciated good mentoring, but found it frustrating when it was not happening.

According to Participant 5: I sometimes did not get feedback on my draft for several weeks. Feedback given at different meetings made it hard to not be confused where to go.

From these examples, it is clear that effective supervision includes consistent feedback, communication and clear expectations throughout the doctorate.

Sub theme 3.3 Institutional Barriers

Limitation of research training, research funding and institutional resources were perceived by the participants. The subjects valued the access to digital libraries, but felt that the universities have the responsibility to offer more in-depth methodological training and funding.

Participant 1 highlighted: We were able to use journals, but there weren't many workshops on publishing. It had been hard to establish research networks without conference funding.

The examples show that institutional investments in the development of research infrastructure and professional development could support the building of competency.

Sub theme 3.4 Research Environment

The value of research culture and peer interaction was emphasized by participants. Collaboration was encouraged by supportive research communities, and limited networking opportunities led to reduced exposure to different research points of view.

Participant 3 and 4 emphasized these: "The research group assisted me with methodological issues. The research seminars were inspirational for me and I wanted to enhance my work."

These quotations show how a positive research environment can serve to support competency development by fostering collaboration and scholarly engagement.

Theme 4: Coping Strategies

This theme examines the strategies that doctorate scholars used to cope with the different personal, supervisory, institutional and environmental difficulties they faced in their doctoral journeys. Although having encountered barriers to research process, participants exhibited resilience by actively seeking ways to enhance their research skills. They were not merely using formal institutional assistance, but they also reported on the use of self-initiated learning processes, working together with others, establishing structured learning goals, and taking advantage of feedback from scholars for further improvement. The results indicate that external resources are not the only basis for successful competency development, but there is also a need for individual initiative and adaptive learning behaviors.

Sub theme 4.1: Self-Directed Learning

One of the coping strategies that participants reported was that of self-directed learning. Some participants reported that their PhD studies often involved learning skills and knowledge which went beyond that taught in a course. As a result, they sought out their own learning experiences via online courses, webinars, research articles, tutorials on statistical software, and methodological textbooks.

Participant 2 explained: "Statistical method I find was challenging, I took an online class."

Similarly, Participant 4 stated: "I regularly watched research methodology webinars and practiced using different statistical software until I became confident."

From these answers, it can be concluded that participants considered the continuous self-learning a necessary part of doctoral studies. They actively pursued knowledge without the need for formal instruction to fill in competency gaps or to become more methodologically competent, or to keep up with research practices. This learning attitude had reinforced their confidence and allowed them to tackle technical research issues on their own.

Sub theme 4.2: Peer Collaboration

Collaboration with other doctoral scholars and research colleagues was another common strategy reported. Participants noted that the collaborative discussions of research ideas, experiences and methodological challenges alleviated feelings of isolation and helped research participants better comprehend the complexities of research.

Participant 3 shared: My PhD students discussed my research with other PhD students, which helped me understand the comments of the reviewers.

Participant 5 similarly noted: We would have ideas during our research discussions and I would be able to solve some problems which I could not solve by myself.

These responses clearly show that peer interaction was an academic and emotional support system. The joint learning approach helped the participants to get positive advices, share methodological expertise and stay motivated in difficult moments of their doctoral process. The results indicate that the positive influences of peer networks on the development of research competency are related to collaborative learning and scholar engagement.

Sub theme 4.3: Goal setting and time management

Setting clear and achievable goals for research was also described by the participants as an effective strategy to keep research going. When their research studies were long and arduous, they found it easier to break up the larger projects into smaller weekly or monthly tasks to help manage

workload, alleviate stress and maintain motivation.

Participant 1 explained: I found weekly goals to write to be motivational.

Participant 4 added: I made a research plan, monthly with deadlines for literature research, data analysis and writing up chapters, to keep me focused.

The above answers indicate that structured planning and effective time management helped the participants manage competing academic, professional and personal demands more efficiently. In the face of setbacks during the research process, goal setting gave a sense of accomplishment and kept everyone on track to be productive.

Sub theme 4.4: Learning from Scholarly Feedback

Feedback from supervisors, reviewers, conference attendees and academic colleagues was seen as an important learning opportunity rather than an assessment of one's work. Participants sometimes got discouraging feedback at the beginning but they explained that they got better feedback from the critical comments and that they gained a better research from the constructive feedback they got.

Participant 2 reflected: At first, the comments of the reviewers were negative but once I paid attention to them, I found that it really helped in enhancing my paper.

Participant 5 similarly stated: "Every revision I learned something new about quality in academic writing and research."

From these responses, it was concluded that the participants gained resilience by learning from criticism. Their ability to edit their papers, consider others' comments and continually work to make them more successful helped their academic development and to build up their competences over time. Participants could generally adapt to the research challenges quite well. Self-directed learning, collaborative learning with peers, systematic goal setting, and engagement in constructive ways to respond to scholarly feedback were identified as complementary strategies that helped doctoral scholars enhance their research skills in the face of

personal and institutional barriers. The results indicate that the doctoral education should emphasize the cultivation of independent learning behavior and cooperative learning atmosphere.

Theme 5: Recommendations

The participants suggested some recommendations for the development of competency in research among Ph.D. scholars. They recommended that competency development must be seen as a lifelong process from the beginning to the end of the doctoral experience and not limited to formal education. The participants suggested improvements at both the individual and supervisory levels as well as at the institutional level, such as continuing training in research, better supervision, greater financial assistance, building up research cultures, and establishing mentoring systems.

Subtheme 5.1: Continuous Research Training.

It was the opinion of the participants that universities should offer ongoing research training during doctoral studies. Though coursework provided a starting point, participants felt that more advanced methodological workshops should be held throughout the doctoral study, as new research challenges arose.

Participant 1 suggested: Research training should not be limited to the coursework and should be carried out during the entire PhD.

Participant 3 further explained: Continual workshops on advanced data analysis and research ethics are needed as research advances, and students need to be trained on publishing.

The answers suggest that competency development for doctoral students is a continuous process of professional learning, which changes over time based on the research process. Ongoing training would enable scholars to gain in-depth methodological knowledge and to stay up to date with the latest research practices.

Sub theme 5.2: Supervisor Development

Participants highlighted the key role of supervisors in building competencies in research and advocated for formal training programs for

supervisors. They felt that effective supervision went beyond the scope of research and included aspects such as mentoring, communication, timely feedback and emotional support.

Participant 5 recommended: Effective mentoring training for supervisors.

Participant 2 similarly observed: The best approach for supporting students is to guide and encourage them at every stage of the research process.

The answers indicate that there may be benefits for doctoral students in improving supervisory practices, both in terms of their research experiences and the development of their competencies. Mentor-ship skills should be considered as an integral part of doctor's supervision.

Sub theme 5.3: More funding and research support

Another significant recommendation was financial support. Participate felt that limited funding was a barrier to participation in conferences, specialized training, buying research software, and establishing professional research networks.

Participant 4 stated: University participation in conferences and collaboration in research should be encouraged.

Participant 1 added: Training and research funding of students would enhance their research skills and network. The answers indicate that increases in institutional investment of research funding can have a positive impact on developing doctoral competency by increasing opportunities to engage in scholarly work and professional development.

Sub theme 5.4: Development of Research Culture

The role of fostering research and research culture in Universities was emphasized. They feel that the seminars, interdisciplinary cooperation, journal clubs and research discussion forums, which take place regularly, facilitate intellectual exchange and ongoing learning.

Participant 3 commented: "Regular research seminars help students to look at things from various angles and enhance their thinking skills."

Participant 4 similarly noted: Collaborating with researchers of other fields enriches understanding and enhances research quality.

The results presented above suggest that promoting research in a positive context fosters knowledge sharing, research innovation, and research capabilities through collaboration.

Sub Theme 5.5: Structured Mentoring Programs

The participants also suggested the development of structured mentoring programs in addition to formal supervision. They put forward the idea that doctoral researchers with adequate academic expertise, faculty members and senior doctoral students may offer assistance and guidance for their doctoral training.

Participant 2 explained: It would be helpful to have a different mentor from my supervisor, to be able to get advice when I faced research problems.

Participant 5 stated: Peer mentoring and faculty mentoring may be beneficial in preparing new doctoral students to become researchers more rapidly.

The answers indicated that there is a possibility for personalized academic support, building research confidence and developing professional skills through structured mentoring relationships rather than the traditional supervisory relationship.

In general, the participants suggested moving towards a comprehensive institutional strategy for doctoral competency formation. They stressed that continuous research training, good research supervision, sufficient funding, as well as well-structured research environments and research mentoring programs all play a major role in the training of competent and independent researchers. The results indicate that enhancing doctoral education will need a concerted effort by universities, supervisors, and research communities to establish an environment that will help develop technical competencies and facilitate career development over time.

1. Table of Themes, Sub themes, and Participants

Theme	Sub themes	Participants Supporting the Theme
Theme 1: Conceptualizing Research Competency	Independent research capability; Essential research skills; Professional attributes	P1, P2, P3, P4, P5
Theme 2: Pathways to Research Competency Development	Coursework as a foundation; Independent learning; Scholarly engagement	P1, P2, P3, P4, P5
Theme 3: Barriers to Research Competency Development	Personal barriers; Supervisory barriers; Institutional barriers; Research environment	P1, P3, P4, P5
Theme 4: Coping Strategies	Self-directed learning; Peer collaboration; Goal setting; Learning from scholarly feedback	P1, P2, P3, P4, P5
Theme 5: Recommendations	Continuous training; Supervisor development; Increased funding; Stronger research culture; Structured mentoring	P1, P2, P3, P4, P5

Discussion

The aim of this study was to explore the barriers to the development of research competency by in-depth qualitative analysis of the experiences of the participants. The results indicate that building research competency is a multi-faceted and dynamic process that is shaped by research environment, institutional support, supervisory relationships, learning experiences and individual competencies. While the objective of the study was to uncover the barriers, participants also described how competencies are developed, what happened when they encountered barriers and their recommendations for enhancing doctoral education. Together, these results indicate that research competency is a process that is not limited to formal doctoral studies, but it is an ongoing process that requires research practice, scholarly engagement and supportive learning environments. The first theme identified that participants defined research competency as a multi-faceted construct that was broader than methodological skills. Instead of focusing on research methodology or statistical skills,

participants reported being competent in research as the ability to “plan, execute and publish high-quality and ethical research independently”. They highlighted the need for critical thinking, academic writing, analytical thinking, ethical responsibility, communication abilities, and professional characteristics that involve resilience, curiosity, adaptability, and lifelong learning. The results suggest that doctoral students' views on research competency are of a holistic nature, involving both technical skills and personal dispositions, which facilitate independent research in the field of the sciences. This multi-dimensional approach supports the perspective that effective researchers need to have cognitive as well as professional skills to work in today's research context. The second theme showed that research competence is built on various learning paths which are interrelated. Participants recognized the need for the theoretical and methodological framework offered by doctoral courses but consistently highlighted the importance of self-study and the active involvement of the learners in academic activities

for building competency. The reading of literature, attending webinars, learning new analytical methods, attending conferences, writing research articles, and responding to reviewers' comments were all perceived as valuable learning experiences. The results indicate that competency development is not just a matter of completion of formal curriculum requirements, but is fostered by ongoing research practice. The experiences of the participants also show that experiential learning is an important role in developing competence in research activities. The third theme found multiple barriers to development of research competency. Limited time and psychological resources for research were reduced by personal issues, including stress, lack of motivation, self doubt, family responsibilities, and work. Supervisory challenges, such as giving delayed feedback, inconsistent supervision, and poor communication, were also mentioned as obstacles to research that delayed research progress and caused uncertainty in the doctoral process. The institutional barriers were lack of methodological training, lack of funding opportunities, and lack of access to professional development activities, and other aspects of the research environment, including weak research culture and limited networking opportunities, also limited competency development. The results of this study show that barriers can be found at individual, interpersonal and institutional levels, indicating that barriers to doctoral competency development are not only personal, but also environmental, and are not exclusively related to personal competency. Yet, the fourth theme demonstrated the strength and flexibility of doctorate holders. The participants reported undertaking a number of proactive coping strategies for continuing to build their research skills. The most prevalent method was self-directed learning, in which participants were engaged in finding their own online courses, methodological resources and research literature to fill gaps in their learning. Peer collaboration was also a key element of the efforts, as it enabled discussion of research problems, exchange of ideas, and emotional support. The use of goal setting and effective time management helped

participants stay motivated and track their research progress, and positive interactions with the reviewer and supervisor fostered ongoing learning and growth. The results indicate that besides institutional support, the ability of researchers for self-regulated learning and reflective practices is crucial in the process of developing competency. The fifth theme was devoted to recommendations of the participants on how to improve doctoral education. Participants supported the idea of regular research training rather than only in the coursework during the doctoral programme. They also suggested structured supervisor development programmes to improve mentoring ability, more funding for conferences and research activities at the institutions, better research cultures which would foster collaboration among researchers, and formal mentoring system along with the traditional way of supervision.

These recommendations emphasize the need for an institutional approach to researcher development. Enhancing the research infrastructure, creating opportunities for shared learning spaces, and investing in training and developing supervisors can significantly expand doctoral students' chances to develop higher level research skills. In general, the results indicate that research competency development should be regarded as an ongoing process and not as a specific product of learning. The doctoral scholars show good sense of initiative when facing challenges in their research, but institutional arrangements, supervision styles and enabling research environments are the pillars of good researcher development. It is time that universities begin to see competency development as a collective effort and shared responsibility, and begin coordinating the effort between doctoral students, their supervisors, academic departments, and institutional leaders. The present study is also a contribution to the existing research on doctoral education which provides a detailed picture of the conceptualization of research competency among doctoral scholars, how they develop research competency, the challenges faced during the process of doctorate and how they overcome these

challenges. The study does not only look at barriers but also offers a holistic view where competency development, challenges, adaptive behaviours and institutional recommendations are linked and dovetailed together. This comprehensive awareness is useful for universities to gain insights for strengthening doctoral education and research capacity.

Conclusion

The study examined the experiences of doctoral scholars in developing competencies in research and the factors that affect their research competency development including personal, supervisory, institutional and environmental factors. The results show that research competency is a multifactorial construct that includes methodological skills, critical skills and thinking, ethical behavior, academic writing, independent skills in researching, and professional skills (resilience, curiosity, collaboration, and lifelong learning). Research competency was seen as an ongoing process and participants consistently stated that it can be built up through formal courses, self-directed learning, research experience, scholarly interaction, and reflection. The study also identified that there are many obstacles in the way of doctoral scholars to build competency. The combined impact of personal responsibilities, psychological pressures, lack of consistent supervisory support, limited institutional resources, inadequate research training, and poor research environments limit opportunities to develop advanced research skills. Participants showed a remarkable resilience, however, adopting the concept of self-directed learning in mind, cooperating with fellow students, structuring their research questions and making use of scholarly feedback to continuously improve themselves. The results highlight the need for institutional support in improving competency in doctoral research, in addition to individual motivation. Universities need to constantly offer methodological training, boost supervisory capacity through professional development programmes, increase research funding opportunities, develop research cultures

and create a structured mentoring system for doctoral scholars during their research process. These will no doubt enhance not only research skills of the doctoral students but also the quality of research in higher education institutions. While the study offers detailed information about doctoral scholars' experiences, its conclusions should be considered in the context of some limitations. A small purposive sample of five doctoral scholars was selected for the study, and participants were selected from a limited institutional context. Thus, the results are not meant to represent statistical generalization. Larger and more diverse samples from several universities and disciplines, longitudinal designs to explore competency development over time, and mixed methods designs to validate and extend the present results are possible extensions for future research. Even with these constraints, the study's findings are of great theoretical and practical value as they provide an integrated perspective on research competency development in doctoral studies. The results indicate that cultivating research competency does not simply involve methodological training, but also supportive supervision, supportive institutional environments, collaborative learned communities, and opportunities for continued learning. Through the integration of these dimensions, higher education institutions can support doctoral scholars to become autonomous, proficient and globally competitive researchers.

Name Declaration:

It is hereby declared that Darakhshan Zahid and Darakhshan Muslim refer to the same person. Following her marriage, Darakhshan Zahid adopted the name Darakhshan Muslim. Therefore, publications, research papers, and academic records appearing under either name belong to the same individual.

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