

# Student Teachers' Perceptions of Theory and Practice Integration through Action Research

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**Abstract.** The purpose of the study is to gain insight into pre-service teachers' perceptions of integrating theory and practice by means of action research. Motivation for the study is the still unresolved theory-practice problem in teacher education. There is still little known in the research area of teacher education about how student teachers link theoretical knowledge and practical situations. The question of how the integration of several elements of the knowledge base of pre-service teachers can be realized is essential for this. A second reason for this study, related to this problem, is the rising interest in action research, which, due to its nature, helps student teachers use university theories for reflection on practical activities, thus contributing to the perception of the theory and practice integration process. The study is qualitative in nature and serves to uncover the lived experience of the 5 participants of the study (referendars<sup>1</sup> in the initial stage of their 18-months preparation program at teacher seminars and practicum settings across North Rhine-Westphalia, Germany) in the process of theory and practice integration through action research.

**Keywords:** theory and practice; teacher education; action research

## Introduction

Research on the relationship between theory and practice in teacher education over the last decades has focused on the questions of how student teachers can integrate theory and practice and what the relationship between the two components should be or which of the two has to be the point of departure when designing the learning environment of a teacher education program (Blömeke, 2002; Cheng, Tang & Cheng, 2012; Dirks & Hansmann, 2002; Korthagen, 2010b).

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<sup>1</sup> In Germany, referendar refers to (a) a trainee solicitor/attorney undertaking an articulated clerkship as part of his/her professional training or (b) a trainee teacher during the practical period of teacher training. For trainee teachers this period lasts between 18 and 24 months depending on the state. During this time, Referendars are employed by and paid for by the state as applicants to the "middle" or "upper service" as government employees (Beamte), depending on which type of school they are training at. A teacher's traineeship consists of academic courses as well as hands-on teaching. At the end of the traineeship, trainee teachers take their Second State Examination to qualify for government employment as teachers.

Recent developments in the area of German teacher education led to an approach of integrating subject matter, pedagogical content matter and school practice (Beckmann, Brandt & Wagner, 2004). However, such an approach does not in itself lead automatically to student teachers' integration of theory and practice. In fact, the central question here is which training method will prevent a gap arising between theory and practice. Another related question, focusing on the development of student teachers, is how integrating several elements of a teacher education program can be realized and how this integration can be stimulated. As yet, little is known how student teachers link theoretical knowledge and practical situations, both vital components of learning to teach.

In this respect, action research is an attractive option for teacher researchers, school administrative staff, and other stakeholders in the teaching and learning environment to consider (Mills, 2011). Action research is generally defined as a form of educational research wherein a professional, actively involved in practice, engages in systematic, intentional inquiry into some aspect of that practice for the purpose of understanding and improvement (McNiff, 2013). The inquiry process involves data gathering, reflection on the action as it is presented in the data, generating evidence through the data, and making claims to knowledge based on conclusions drawn from validated evidence (McNiff, 2013). This sequence of actions, when applied to teacher education, bridges the gap between theory and practice (Johnson, 2012). For instance, the theoretical components underpinning action research practice are used to help practitioners understand and observe what is happening in a classroom setting. At the same time, and with the interests of best practice in mind, these collected data "are used to understand or inform theories and research related to best practice" (Johnson, 2012, p. 20). In a similar vein to the enhancement of the professional disposition of teachers, action research encourages teachers to become continuous learners within their classrooms and schools (Mills, 2011). Because of the professional, reflective stance required by practitioners engaged in the action research sequence, teachers are further encouraged to "examine the dynamics of their classrooms, ponder the actions and interactions of students, validate and challenge existing practices, and take risks in the process" (Mills, 2011, p. 46). Therefore, providing teachers with the necessary skills, knowledge, and focus to engage in meaningful inquiry about their professional practice may have a positive outcome on the integration of theory and practice.

Action research initiatives are widely used within teacher education programs in Australia and in the United States. In Germany, on the other hand, the concept is not so extensively introduced. The biggest concern of German teacher educators is the introduction of action research to the second phase of teacher education (referendariat) (Warneke, 2007) as there is a considerable disparity between theory and practice in this phase (Schubarth, 2007). Mayr (2006) suggests that the theory and practice integration is hardly achieved in referendariat representing its immense drawback. In the proposed study we attempt to find out whether the situation improves if student teachers are introduced to action research and engage in meaningful inquiry about their professional practice.

## **Theoretical background**

### **Theory in Teacher Education**

The relevance of research on the concept of theory in teacher education is twofold. First, pre-service teachers' use of theory as a part of the "linking process" between theory and practice, particularly in the way that theory supports observing and analyzing practice, can therefore lead to improving future teachers' practice. Theories can provide an instrument for teachers to recognize more quickly and adequately all kinds of aspects of the teaching-learning process. Teachers who can handle such an instrument are able to see more in the same situation and therefore can think, speak and act more effectively (Cheng, Tang & Cheng, 2010; Korthagen, 2010a). Second, establishing a knowledge base that underlies teachers' practice is a condition for improving the status of teaching as a profession (Mtika & Gates, 2011; Terhart, 2001).

Theoretical knowledge is a significant part of the professional knowledge base of teachers and provides the possibility to reflect educational situations (Dirks & Hansmann, 2002; Hagevik, Aydeniz, & Rowell, 2012). Thus, a prominent function of theory is providing an orientation base for reflection on practice. The learning environment of pre-service teachers needs theoretical supply and furthermore, the guidance of an expert in order to level up the student teachers' practical reasoning.

### **Practice in Teacher Education**

Practice is a (learning) environment in which a profession is practiced (Southgate, Reynolds & Howley, 2013). A professional worker in that environment has been trained to act professionally, that is to say to act adequately on the (practical) knowledge base. A teacher can also be considered as someone who practices a profession (Terhart, 2001). Practice has many representations, which can be based on a number of views. In German teacher education, *referendariat*, an important representation of practice, is a teaching and learning place for prospective teachers. There are several functions of *referendariat* within teacher education in Germany, for example, the function of a training area for learning to teach or the function of the practice school as a laboratory to review and improve student teachers' instruction skills.

### **The Relationship between Theory and Practice in Teacher Education**

It was always unclear for a teacher education program to define a theoretical dimension of teaching practice. The simplest approach was: you will learn theory during lectures and will then apply it in practice. It was implied that theory would help generate hypothetical solutions to practitioner problems, thus "applied in practice" (Drever & Cope, 1999). However, according to Abel & Faust (2010), student teachers often indicated that knowledge acquired at a teacher education program did not enable them to handle the uncertainty, the complexity and the instability of actual practice situations.

On the one hand, one can state that the training philosophy slogan “learning theory at academy and applying theory in practice” is outdated. On the other hand, there is still no clear solution to the problem of theory and practice integration in a teacher education program (Makrinus, 2013; Vogel, 2011). However, there are several strategies that can contribute to that integration, such as strong involvement from school and university staff and well designed infield experiences, reflective practice and inquiry approach, development of professional knowledge base, establishment of professional development schools. In the context of the discussion about relating practical and propositional knowledge, there is a rising interest in action research as a possible strategy to integrate theory and practice (Hagevik, Aydeniz & Rowell, 2012; Hendricks, 2006; Hermes, 1997; Sales, Traver & García, 2011; Warneke, 2007). We assume that action research can start a process in which student teachers link theory and practice in a meaningful way.

“Linking theory and practice” hereby can be defined as an adequate use of theoretical knowledge when reflecting on practical situations, putting and reaching teaching/learning objectives, analyzing practical experience, drawing conclusions and putting new objectives.

### **Action Research as a Way to Strengthen the Connection between Theory and Practice in Teacher Education**

According to McNiff, Lomax & Whitehead (1997) “... action research is a powerful method of bridging the gap between theory and practice of education; for here teachers are encouraged to develop their own personal theories of education from their own classroom practice” (p. 1).

Contemporary theories state that action research is a way to promote a cyclical process of improvement that includes describing a problem, seeking knowledge from previous investigators, collecting data, devising and implementing a strategy for change, evaluating the results and planning for another cycle of improvement (Authors, 2009). Action research is seen as “a series of steps in which the action researcher reflects, acts, and evaluates” (Hendricks, 2006, p. 9). Thus, action research provides the need to get substantial theoretical base to reflect and evaluate practical experiences and stimulate their integration.

Johnson states that action research is “a type of inquiry that is preplanned, organized, and can be shared with others” (Johnson, 2003, p. 1). Action research is more than a mere concern over the technical problems of teaching, but provides the teacher with the necessary tools to investigate their perspectives on curriculum and moral concerns. This approach to action research moves away from the positivist and empirical approach to one that is more interpretive and critical (Capobianco & Feldman, 2010).

In Germany the concept of action research is known as “Hand lungs for schung” or “Aktions for schung” and is closely related to the name of Wolfgang Klafki. He stated that “action research should not be considered as an alternative to traditional empirical research, but if it comes to supporting educational

innovations that can provide improvement in one's teaching, action research can prove to be an appropriate approach with a great future" (Klafki, 1974, p. 271). Hermes (2001) defines action research as "... a combination of methods, that help teachers to reflect on themselves and their own teaching, make respective changes, analyze and evaluate themselves in relation to the expected educational aims" (p. 9). According to Altrichter (1989), "action research offers teachers assistance for further development of their knowledge and skills, allows them to enhance their professionalism and increase their social status" (p. 4).

As we can see, there is, on the one hand, a range of positive statements on the possibility of action research to prove as a way of theory-practice integration in teacher education, and, on the other hand, there are no substantial empirical investigations in Germany on action research, especially in terms of how it helps student teachers perceive that integration. Thus, we will provide an empirical justification from the view of participants of the study on action research as a way to strengthen the connection between theory and practice in teacher education.

## **Method**

According to the literature analysis, it was revealed that there are very few studies emphasizing the views and experiences of pre-service teachers, to bring out their understanding of theory-practice integration process by means of action research. Thus, the research was designed to shed light on this problem and answer the **research question** "*How do the pre-service teachers perceive the theory and practice integration through action research?*"

The case study that this paper reports was conducted at teacher seminars and practicum settings of pre-service teachers across North Rhine-Westphalia, Germany during the second phase of teacher education (referendariat). In the study we took into account lived experience that is rooted in meanings, interpretations and activities of individuals.

### *Participant Selection*

Purposeful selection of participants is a key decision in qualitative research (Creswell, 1998). Initial contact with the participants was made by e-mail. 14 student teachers undergoing their practical training (referendariat) agreed to participate; however when contacted later to arrange a suitable time for interview, only 5 participated. Reasons provided for not continuing onto interview included family and work commitments and a lack of time. The main characteristics of the 5 pre-service teachers are outlined in the following table:

**Table 1: Participants of the Study**

Pre-service teachers	Gender	Age	Educational background	Practicum Setting
P1	Female	28	1-st State Exam for gymnasium <sup>2</sup> and comprehensive secondary school (English/History)	Bielefeld
P2	Female	27	1-st State Exam for gymnasium and comprehensive secondary school (German/Philosophy)	Duisburg
P3	Female	26	1-st State Exam for gymnasium and comprehensive secondary school (German/English)	Bonn
P4	Male	25	1-st State Exam for gymnasium and comprehensive secondary school (History/Philosophy)	Cologne
P5	Female	27	1-st State Exam for gymnasium and comprehensive secondary school (Geography/French)	Essen

### Data Collection and data sources

Data collection was conducted over a period of the first six months of referendariat (11.2013-04.2014) to enable the researcher to collect data from the five pre-service teachers in the process of their practical training, analyze and write the narrative. The data for this study was gathered mainly through in-depth interviews; some ideas relevant for the study and revealing the participants' perceptions of theory-practice integration through action research were also taken from pedagogical diaries of the participants, their self-observation notes, and pupils' and colleagues' evaluation surveys during the training.

#### *Interviews*

Interviews were the main source of data collection for the study and were conducted by phone due to the broad geographical spread of participants (Fenwick, 2011). Notes taken during interviews identified participants by code (e.g. P1) and included both verbatim and paraphrased recordings of their responses. The interviews provide the explanations and interpretations through the voices of the specific interviewees who can provide important insights into this particular situation. Essentially, in-depth interviewing provides the researcher with an understanding of other people's experiences, and the meaning they make of those experiences (Seidman, 1998).

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<sup>2</sup> The gymnasium, in the German education system, is a type of secondary school with a strong emphasis on academic learning, comparable with the British grammar school system or with prep schools in the United States.

The interviews were qualitative in nature and were taken on a conversational aspect where the pre-service teacher and the researcher participate in a conversation that covers open-ended questions. Here, we asked key questions for facts as well as the opinions of the participants, and insights into certain occurrences (Yin, 2009). The open-ended questions were included for the participants to demonstrate their unique way of looking at the world and their definitions of the situations (Silverman, 1993). The interview questions focused on: a. the teachers' personal and academic background, the reasons for choosing the particular practicum place and their attitude towards the acquired at the university theoretical knowledge, gathered practical experience and the ability to use both when performing professional duties; b. the student teachers' understandings of action research; c. the student teachers' perceptions of theory and practice integration through action research.

Follow up questions were used for clarification and to capture the unfolding of the perspectives of the participants' as they view the phenomenon of interest, and not how the researcher views it (Rossman & Rallis, 1998). The technique of three separate interviews was adopted for the study (Seidman, 1998). The first interview established the context of the participants' experience. The second interview allowed the participants to reconstruct the details of their experience within the context, and the third interview encouraged the participants to reflect on the meaning of their experiences (Seidman, 1998).

#### *Pedagogical diaries, self-observation notes and evaluation surveys*

At the beginning of the referendariat the pre-service teachers were required to write a pedagogical diary as part of their practical training process. It was also suggested to take self-observation notes during the lesson. Evaluation surveys by pupils and colleagues were conducted on a weekly basis. The materials were scanned by the participants and sent to the researcher by e-mail. At the end of each month the materials were analyzed and formed a part of the data, which were used to extend the views of the pre-service teachers on the process of theory and practice integration by means of action research.

### **Data Analysis**

Data analysis is a process of bringing order, structure, and meaning to the data. Each phase of analysis entails the reduction of data collected into manageable chunks so that meaning and insight is brought to the words and actions of the participants in the study (Rossman & Rallis, 1998).

Data analysis process comprised of two phases. The first phase of data analysis was aimed at filing the interviews and organizing the narratives of each student teacher. The interviews and transcriptions for each participant were numbered. The interviews were then read and re-read to become familiar with the participants views. We read the interview transcripts and wrote the ideas that the participant was conveying. According to the main goal of this study, we searched for patterns in the data noting any traits of pre-service teachers' personal experiences of integrating theory and practice by means of action research. The

second phase of data analysis served the purpose of coding collected data from pedagogical diaries, self-observation notes and evaluation surveys to match the patterns we planned to identify in the interviews. The participant's written materials were categorically analyzed, a process which involved reading through the data to assign codes to significant words, phrases and ideas. We then compared and contrasted our individual codes in order to develop broad categories and then identify a number of themes in and between the categories (Coffey & Atkinson, 1996). Also, we looked for similarities between the themes generated from the two sets of qualitative data and then again scanned the whole data-set to ensure that we had effectively identified commonalities between themes and relationships among these themes (Coffey & Atkinson, 1996).

It was anticipated that the emergent themes would answer the research question and illustrate the process through which the pre-service teachers experience the theory and practice integration.

## **Results and discussion**

The results and findings of this study reflect participants' perceptions of how they perceived and interpreted the integration of theory and practice through action research during referendariat. Responses to open questions during the interviews provided insight into participants' beliefs and attitudes about their theoretical knowledge, their practicum experiences to date and their perceptions about action research as a way to connect them. Findings generated through data analysis can be categorized into two themes. First, participants in this study largely valued both the theoretical and practical components during referendariat, which stands in contrast to the commonly identified tendency of the student teacher to favor practice over theory. Second, participants overwhelmingly supported action research as a means of bridging the gap between, on the one hand, the university and the school and, on the other hand, theory and practice.

Previous studies have shown that student teachers often privilege the practical side of their program over theoretical knowledge (Allen, 2009; Flagmeyer & Hoppe-Graff, 2006; Oelkers, 1999; Schubarth, Speck & Seidel, 2011), with some students advocating a return to an apprenticeship model of preparation (Allen, 2009; Schubarth et al., 2012; Hascher, 2012). While there was some evidence in this study of a student preference for practice, this was not to the exclusion of theory.

*"It's really important to have both – my feelings about that haven't changed. You need to have a conceptual basis and then put it into place, and referendariat is a great way to do this. School setting is a great place to find out if your conceptual understanding fit with the way you actually teach" (P3).*

Furthermore, two participants spoke out against wholly practice-based training, as in the apprenticeship model:

*"I'm a great believer in linking theory and practice. It's important to have a conceptual and theoretical framework to work around. It doesn't always work but it's important to*



*understand the conceptual understanding – I don't think this would happen in an apprenticeship model" (P2, P5).*

*"The two are circular – you learn the theory and put it into practice and then refer back to the theory with evidence from practice and make improvements" (P4).*

P5 mentioned that it was very important to gain a substantial theoretical basis at the university and *"... apply it to practice as we wanted to analyze and understand it" (P5).* P1 said that *"it is important to learn first and get a general idea of how to use action research and reflection strategies and then try them out in your own teaching" (P1).*

Linking carefully constructed practicum experiences with on-campus courses has been highlighted as one of the most powerful and effective ways of supporting student teacher learning (Darling-Hammond, 2006). In a national study of teacher education in the USA, Darling-Hammond (2006) singled out action research as one of the most influential way to make explicit links between theory and practice. Some follow up German studies highlighted the same idea (Wildt, 2011; Warneke, 2007). Across the entire set of qualitative data, participants also referred to the benefit of action research during referendariat as a means of bridging theoretical knowledge and field experience. When asked whether they were able to make more linkages with the action research compared to their previous practicum experience, 4 participants responded that they were able to make more linkages. When analyzing all response comments made by student teachers, we found that the overwhelming majority of comments concerned linkages:

*"I saw and experienced most everything we learned. Action research helps us to relate what we are learning directly to the classroom. Being engaged in action research really helped in establishing a link between what is learned and how I practice it" (P5).*

*"I'm a great believer in linking theory and practice. It's important to have a conceptual and theoretical framework to work around. Action research makes it happen" (P5).*

*"Action research is therefore a link the theory and practical experience, the bridge that connects theory to practice" (P3).*

*"The most important thing about action research is the ability to think and to rethink your teaching, to reflect, to draw connections with the theory you learned at the university, to create a network with colleague-teachers, to discuss teaching problems with them and to find a solution strategy" (P4).*

P4 points out practical relevance as an essential feature of action research: *"Everything I've learned up to this point was theory and action research was theory in practice or theory in use. I became a real teacher by means of action research. Theory or practice only does not make you a professional pedagogue, a combination of both – does" (P4).*

Given these data, we were able to conclude that action research provided teacher candidates a context in which they were able to make substantial linkages between courses and practicum.

Another feature of action research mentioned by all of the participants is the ability to research and evaluate professional actions. The best way of gaining the research experience during practice is, according to P2, is the *"... combination of three elements, which comprise of attending lessons of the more experienced teachers, your own lesson-attempts with video and audio recordings and, finally, their analysis"* (P2). Such a strategy *"... transforms my perspective from a student to a researcher"* (P2). Thus, P2 implies that due to action research she can actively use theoretical knowledge in her teaching practice.

Action research allows student teachers to gain research and evaluation skills for enhancing studies: *"I wrote the diary of many different events and that was a real reflection throughout the practice. I dealt with contemporary educational theories trying to explain and find solution to the pupils' problems and that helped me pass the final in educational theory"* (P3).

Acquiring research skills when dealing with action research methods enabled P3 to *"... gain a new perspective on my own teaching and enhanced my research skills"* (P3). According to P3, this resulted in a feeling of having the so-called "teaching tools" that made her feel "confident and creative" about her teaching.

P2 sees action research as a *"... compulsory component of any teaching practice through which you can gain research abilities. If you use action research in your practice it is not like you are reading a book about some theoretical issue, it is the process of using one in your own practice"* (P2).

As we can see, the participants mention the importance of research skills for evaluation and reflection of practical activities. The theoretical basis and knowledge of research methods come here at hand as *"... if you are unaware of theoretical issues and research methods you will surely face the difficulty of using ones in practice"* (P5).

Thus, having the theoretical basis, participants feel more comfortable in reflecting practical activities and refer to some existing theories when looking for a specific solution to a particular problem.

Practicability of action research was also extensively mentioned by all of the participants during the interviews. The feature of practical relevance makes action research for the participants an effective training process, the lack of which they perceived during their studies at the university. In particular, the cycle of action and reflection, when teaching and learning processes are analyzed, makes it clear that action research is always based on the real-life experiences in the classroom.

P4 emphasizes the importance of practical experience for the process of learning as the acquisition of theoretical knowledge is not sufficient for professional development in a teacher training program. P1 considers the practice, not the

theory, the primary source of action research: *"It is the practice from where you draw conclusions and strategies for improvement."* However, the practical relevance of the approach does not limit P1 to the use of theory but inspires to combine practical skills with theoretical knowledge in a meaningful way.

The interview statements from three participants (P2, P3, and P5) imply that action research helps to reinforce learning in practical training: *"I have found it to be very intense. And yes, I have to say that my expectations to integrate theory and practice were more than fulfilled"* (P3).

This intensification of learning is mainly due to the comprehensive analysis of participants' teaching role, which is always seen in the context of action research as an interplay of action, reflection on action and development of problem-solving strategies or guidelines for further action: *"... this semester was very short and I think if this internship would not have been embedded into the framework of action research, the study process would have never run so intense"* (P5).

While the literature is largely critical of current models of (German) teacher preparation (Abel & Faust, 2010; Valencia et al., 2009; Zeichner, 2010), the emphasis lies in calling on the profession to improve current programming content and delivery arrangements (Darling-Hammond, 2010; Grossman, Hammerness, & McDonald, 2009; Kiper, 2003; Korthagen, Loughran & Russell, 2006; Lüders, 2010) rather than in returning to practice-based learning. The student teacher voice emerging from this study would seem to support this call. Indeed, there is evidence that action research during referendariat allows student teachers establish visible links between theory and practice. These comments are indicative:

*"You can't just learn from a classroom. Neither can you acquire necessary practical skills while studying theory at the Uni"* (P2).

*"You need to do the readings to get subject matter knowledge and research methods knowledge and then you should go to a classroom and apply it. Of course, you can't become a perfect teacher overnight. But this is what action research is for. It allows you to evaluate your teaching, analyze it and single out the points to be improved. Then you should again go to a classroom and make a new cycle. Constant process of improvement is what really helps you become a perfect teacher"* (P1).

Thus, action research, according to the student teacher reflections provided in this study, allows students to find themselves impelled in their ability to integrate theory into practice, to feel a clear demarcation between coursework and referendariat.

## **Summary and conclusion**

The aim of the study reported in this paper is to respond to the central research question, "How do the pre-service teachers perceive the theory and practice integration through action research?" The research question, results and findings were aimed at contributing to an understanding of how student teachers

perceived and interpreted the integration of theory and practice through action research during the first six months of referendariat.

Two key findings emerged from the analysis of the qualitative data. First, students in this study value both the potential to enact theory and the opportunity to be involved in practice during their practicum experience being appointed as referendars. This finding can be contrasted with those of many other studies where students have been shown to favor practice over theory (Allen, 2009).

Second, according to participant responses, the optimum practicum environment in which students believe they can enact theory is one in which there are possibilities to reflect and evaluate their practical experience. Of particular importance is the research cycle which allows referendars, on the basis of the theoretical and research skills, to draw conclusions from personal practical experience and outline further professional improvement.

Thus, students strongly advocate embedding action research in referendariat and question why this is not included in current practicum arrangements. Unlike many other strategies of teacher training during referendariat, action research intensifies the pre-service teachers' professional development and allows forming the necessary professional competence for further successful performing of professional duties.

These findings point to the fact that embedding action research in a practicum setting would ensure that the student experience of integrating theory and practice is enhanced.

The limitations of the present study include the following. First, data were collected with one cohort of student teachers (for gymnasium and comprehensive secondary school). Second, the sampling comprised participants from only one of the 16 German states (North Rhine-Westphalia). Third, data collection was conducted over a period of the first six months of referendariat, whereas there were 12 more months to complete and which could also be beneficial for the participants in terms of theory-practice integration. Thereby, everything mentioned limits potential generalization of the findings.

Accordingly, more research on the same theme is needed in order to validate and generalize the findings from the presented study. More studies with broader samples and context in terms of participants' number, time span, and the place of experimenting may be seen as the most demanding research avenues. The findings of such studies when conducted are expected to overcome the limitations of the presented study and accordingly to further validate the presented findings.

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