

Changes in Teachers' Understandings, Attitude, and practice related to Action Research: The Influence of Gender and Inclusive Pedagogy Training in Bangladesh

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ABSTRACT

Action research has been found to be potential in solving classroom related problems in teachers' own context and for bringing changes in classrooms making the classrooms more inclusive. Therefore, in a 5-country consortium project, while using a co-designed teachers' professional development on Gender and Inclusive Pedagogy (GIP), action research was in-built as an important part for problem solving. In a four-tier training program, 95 teachers of the 20 experimental schools of Bangladesh were oriented with action research and gradually achieved necessary skills to practice action research in their classrooms. After each phase of trainings, teachers practiced action research as a tool to mitigate issues related to GIP practice. Both quantitative and qualitative data were obtained from three different sources- observation of the teacher training sessions related to action research, pre and posttests of the trainings, and reflective journals of the teachers. Findings reveal changes in teachers' understanding, attitude and practice related to action research. Quantitative data shows that there are significant differences in teachers' understanding related to action research between the pre and post tests in the last two tiers of the trainings. There is significant change in teachers' 'attitudes' related to action research too between the pre and posttests in the third and final tiers of the trainings. Qualitative data also depicted the same gradual changes in teachers' understanding of and attitude towards conducting action research. Lastly, 17 teachers (8 individually and 9 collaboratively) practiced action research in their classrooms to address different issue or challenges related to student participation and achievement regarding gender and inclusion aspects. The teachers reported reduced student absenteeism, increased student participation in group work, more participation of girls and special need children, more organized and student friendly classrooms. However, challenges remained in ensuring the participation of all students in a meaningful way ensuring quality learning which the teachers are trying to achieve in their next action research cycles. Teachers expressed their worries that they may not be able to continue the action research when the project period is over as there will be no support from the project team members. The study suggests creating groups among teachers in nearby localities who can share, help and collaborate in each other's action research.

Keywords: Teachers' understandings, teachers' attitude, teachers' practice, action research, gender and inclusive pedagogy

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Introduction

A growing body of literature suggests that teacher-led research on their classroom environments and institutional practices can serve as a potential tool for professional growth (Erickson, 1986; Megowan-Romanowicz, 2010; Wakeman et al, 2022). Educators have emphasized the idea of “action research” (AR) in this era of change to improve conditions in the classroom (Flornes, 2007). Flornes (2007) also notes that AR includes the teachers’ voice and requirement to make informed decisions about their own practices. Bullough and Gitlin (1995) argue that this kind of research approach enables educators to do methodical inquiry to assess their teaching and pose questions about theory and practice. At the core of AR is reflection: those who conduct AR are encouraged to consider their actions, their motivations, and the results of their work (Mertler, 2013).

Knowledge creation that is personally relevant and meaningful is one of the key benefits of AR (Kennedy, 1997). Additionally, it helps teachers better understand how they conduct their own teaching (Kincheloe, 2003). AR has been shown to have major positive effects on teacher education in an increasing number of studies and AR helps educators become more critical, analytical, and thoughtful about the ways they teach (Keating, Diaz-Greeberg, Baldwin, & Thousand 1998; Rock & Levin, 2002). Chant, Heafner, and Bennett (2004) note that they become more aware of and capable of expressing their own teaching philosophies, outlining their actions and rationale. Additionally, they become more conscious of and appreciative of methodical investigation, contemplation, action, and transformation. (Kitchen & Stevens, 2008). They also become more conscious of the needs of the various learners (Goodnough, 2011), increase their self-assurance and depth of understanding of curriculum and pedagogy (Goodnough, 2011; Rock & Levin, 2002). Additionally, they acquire the discretion and disposition required to use their knowledge and abilities in the classroom (Lattimer, 2012). Ultimately, their confidence as educators increases, and their overall and individual efficacy as teachers rises (Henson, 2001).

AR encourages bridging the gap between research and practice, which frequently prevents the application of good practices in schools with clear needs (Hine, 2013; Mertler, 2012). According to Bradbury and Reason (2003), “the core concern for action researchers is to develop practical as well as conceptual contributions by doing research with, rather than on people”(p. 156). In cycles of planning, reflection on planning, and practice, AR provides a chance for educators to reflect on their own practices (Creswell, 2012) and encourages this. AR, according to Guy Wamba (2010) goes beyond the notion that theory may inform practice to acknowledge that theory can and should be generated through practice. According to Hine (2013), AR can be utilized in the field of education to enhance both students’ experiences and teachers’ professional growth. It has advantages including empowering both teachers and students to participate in a structured reflection process. Contemporary research evidence suggests that AR has huge potentials for teachers’ professional development (Al-Mahdi, 2019; Ayaya, Makoelle, & van der Merwe,

2020; Miedijensky, & Sasson, 2022; Ngwenya et al, 2021; Sato, Mutoh, & Kleinsasser, 2022; Wakeman et al, 2022). For examples, Al-Mahdi (2019) acknowledges AR as one of the widely used approaches in both research and teacher professional development. His findings show the potential benefits of AR in building teachers' professional capacity. Another study conducted by Ayaya, Makoelle, and van der Merwe (2020) has found that teachers were able to share and refine their own understandings of ideas through participation in Participatory Action Research (PAR). The study also sheds light on the inclusion aspect of classroom enhanced through AR. They found that instructors in full-service schools must be thoughtful, critical, and inventive in their approach to teaching in order to meet the various learning requirements of all students in the classroom. These are qualities essential for fostering inclusive teaching and learning. The study has supported PAR's viability as a change method for inclusive instruction.

Ainscow, Booth, and Dyson (2004) conducted a research titled 'Understanding and developing inclusive practices in schools: A collaborative AR network'. An explanation of the methodological insights and new discoveries of a collaborative AR network in England is given in this study. Teams of researchers from three universities are involved in the Network, collaborating with practitioners from local education authorities and schools to investigate strategies for creating more inclusive practices. The report also summarizes new insights on the possible advantages of practitioner-academic collaborations. Potentials of AR for teachers' professional development, especially for promoting inclusive classroom practice, are also evident in a very recent study of Wakeman et al (2022). In this study a Professional Development and Coaching Package for Educators were developed using AR within Inclusive Reading Instruction. The aim was to use AR to produce a model of professional development that includes comprehensive coaching assistance for evidence-based practices. Another goal was to develop tools to facilitate co-planning and instructional adjustments in inclusive classrooms. The study's objectives were achieved, according to the results. Findings indicate a number of practical implications as well as the potential to create a second version of the model based on student achievements and regular feedback from teachers... Nonetheless, there is a lack of considerable evidence in the literature about the impact of specialized pedagogical training, such as GIP, on the attitudes, knowledge, and use of AR by the teachers.

The purpose of this research is to investigate the ways in which Gender and Inclusive Pedagogy (GIP) training which is a part of an international collaborative project can affect teachers' attitudes, knowledge, and use of AR. This study also looks at the usage of AR by Bangladeshi secondary school teachers as a means of resolving issues that may arise when implementing GIP in teaching-learning practices. While UN's SDGs (2015) state that providing inclusive and equitable high-quality education is a worldwide commitment, Bangladesh's National Curriculum Framework 2021 (NCTB, 2021) gives these issues consideration. As a result, this study has implications for AR, inclusive quality education, and the professional development of teachers.

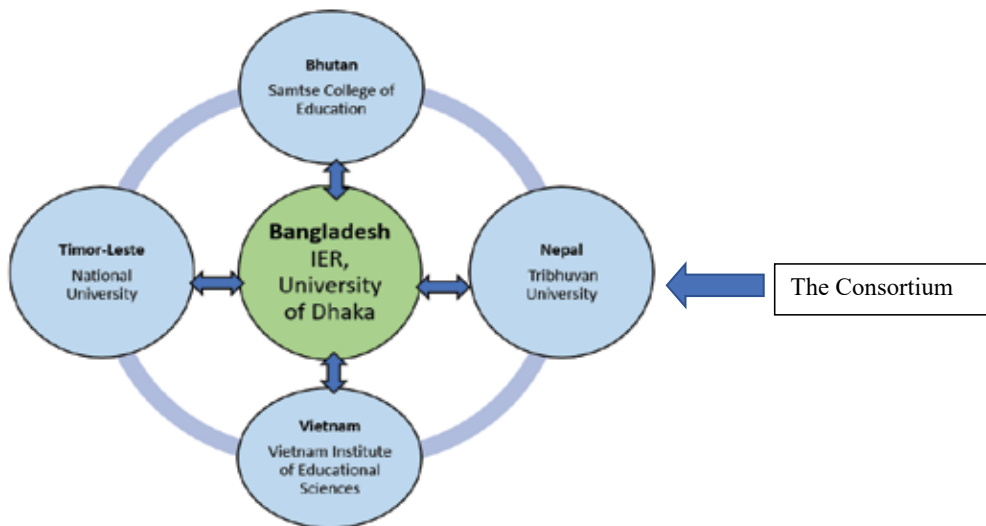
Background of the study

This study is based on one of the outcomes of an international collaborative project titled “The Impact of Gender and Inclusive Pedagogies on Students’ Participation and Learning Achievement at Secondary School during the Pandemic and Beyond.” The project is being carried out in five country contexts- Bangladesh, Bhutan, Nepal, Timor-Leste, and Vietnam since May 2020, funded by the IDRC.

The project aims to enhance participation and learning achievement of the secondary level students in the above-mentioned countries. For this, respective teachers were trained through a teacher professional development program about Gender and Inclusive Pedagogical (GIP) Approaches. The purpose of this GIP training was to elevate teachers’ attitude, sense of self-efficacy, and pedagogical practice regarding GIP.

Figure 1

The institutions of five countries in the consortium



The Gender and Inclusive Pedagogy (GIP) as an Intervention Model

Gender and Inclusive Pedagogy has been conceptualized in this project combining the concepts of ‘Gender transformative strategy’ and ‘Inclusive Pedagogy’. Here, **Gender transformative strategy** ensures gender equity and equality, empowerment, choice of decision-making, shared control of resources, and redefining gender roles (International Development Research Centre [IDRC], 2020). **Inclusive pedagogy** ensures system transformation for enhancing

the participation (access, attendance, engagement in academic and co-curricular activities, promoting school culture) and learning achievement (achieving competencies) of all students regardless of their ability, ethnicity, geographical remoteness, diversity, and other background (Global Campaign for Education, 2020). When these two strategies are combined, inclusive reforms take place leading to gender equity.

Components of GIP Model

This GIP teacher professional development program is a co-designed four phased training built from four gender and inclusion related projects of Bangladesh, Bhutan, Nepal, and Vietnam which were successful in the respective country context. The Gender and Inclusive Pedagogy (GIP) includes various components from four good practices in four countries: Inclusive Model School Development (Bangladesh), Inclusive School Model (Bhutan), School-based Quality Education Model (Nepal), and National Model for Special needs support (Vietnam). Bangladesh's Inclusive Model School Development includes the components- conceptualizing gender & inclusion, diversity as beauty, inclusive pedagogy (cooperative learning strategy), inclusive assessment, mentoring mechanism, inclusive culture, teacher as researchers. The components of Inclusive School Model of Bhutan are inclusive practice (professional development, accessible environment, curriculum & assessment) and inclusive culture (infusing inclusive values, diversity & dignity, child protection, gender equality). For Nepal, community engagement in school management, enhancing school leadership, mentoring, and continuous backstopping support for teachers were the components of their school-based quality education model. Vietnam's National Model for special needs support has the components, inclusive teacher development, inclusive assessment, school level research, and curriculum flexibility.

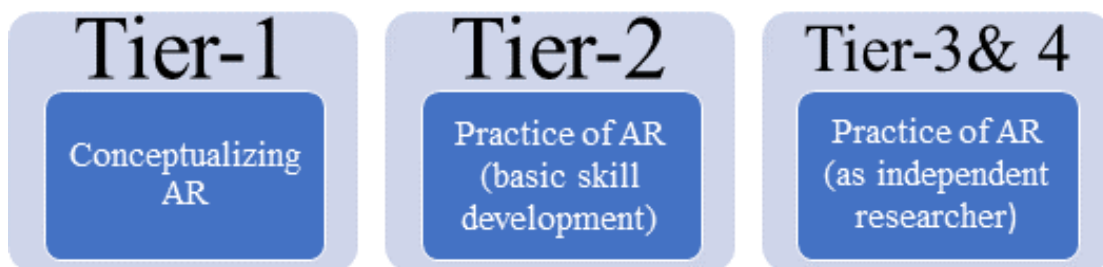
Incorporating Action Research into the Gender and Inclusive Pedagogy training

Research shows that one of the major issues identified by the teachers regarding their practice of inclusive education is that they do not have enough training on this (Rahman & Hill, 2013). Many authors and researchers argue that teachers can improve the practice of inclusive education in their classroom through AR (Armstrong & Moore, 2004; Connett, 2020; Ayaya, Makoelle, & Merwe, 2020). They support AR because it takes into account teachers' personal contexts in addition to solving their own teaching-learning-related problems. Besides, unlike traditional research, AR empowers teachers to solve their own problem which is important for teaching students with diverse needs (Connett, 2020). Therefore, the project employed AR as a part of the training programs to equip the teachers with skills and understanding of teachers. The idea was for them to be able to use AR to mitigate difficulties or find solutions when utilizing GIP in the classroom.

The project has provided the secondary school teachers of the experimental schools of all the five countries with the GIP training intervention that included the concept and practice of AR in four tiers (see Figure 2).

Figure 2

Teachers' orientation of action research in GIP training package

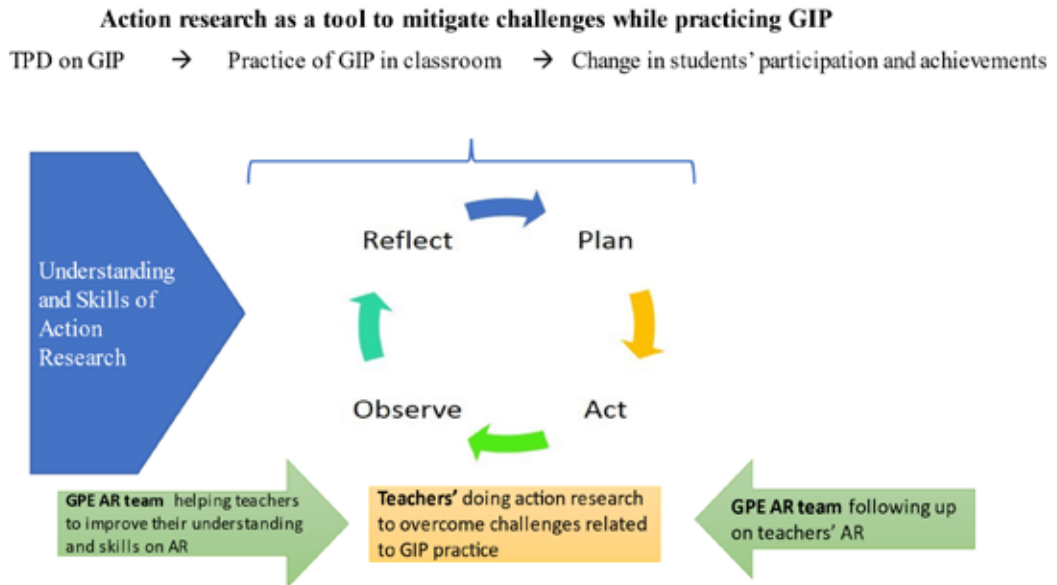


In the first tier, the training helped the teachers to conceptualize what is AR; its characteristics and why it is important for teachers' professional development for problem solving. The teachers also connected this with their classroom practice experiences. In the second tier, teachers analyzed the basic skills needed for conducting AR. They became acquainted with Kurt Lewin's (1946) four-step AR model. They developed a plan for small scale AR to solve issues related to student participation and achievement in their classrooms. They implemented their plan in their classrooms and recorded their observation related to the changes that they desire to bring in classrooms. They were given a reflective diary so that they can write down their practice of AR and reflection on the process. The teachers started their practice of AR going back to their school after the tier-2 training.

Teachers came for the tier three training after 3 months and shared their progress. Both the team members of the project (GPE AR team) and teachers from other locations shared their ideas and gave feedback. The teachers revised their plan based on the feedback they received. They again went back to the school and practiced AR to solve the problem they identified using the refined plan. In tier four training, they shared their results and reflected on the process. Based on their results, some had to extend their plan with minimum help from the project team (as they could not finish by that time), some revised their plan (as the plan did not work to solve the problem), and some started a new plan starting a new cycle of AR for another problem of their classroom (as they thought that they have achieved their goals). The teachers then went back to the school again and were in the AR cycle again. Besides the face to face trainings, there were online follow up sessions after each tier where teachers got support from the team if needed and exchanged their ideas and problem-solving examples in their own context.

Figure 3

The project's strategy to support the teachers for their action research



There were pre and posttests after each phase of trainings where the teachers were asked questions related to their knowledge, understanding and practice of AR. The present paper is developed based on one component of the project, AR. Here, AR implies that the secondary education teachers are expected to use it as a tool to solve possible challenges in applying GIP (project intervention) in teaching-learning. This study is based on the data collected from different tiers of training in Bangladesh.

Research Questions

The study addressed the following research questions-

1. How did the Gender and Inclusive Pedagogies (GIP) training affect teachers' comprehension of AR?
2. How did teachers' attitudes toward undertaking AR change as a result of Gender and Inclusive Pedagogies (GIP) training?
3. How did the teachers use AR as a tool for overcoming challenges in practicing GIP?

Methodology

This study explored whether teachers' understanding of, attitude towards, and practice of AR has been changed as a result of GIP training, comparing the post-test results of different phases (tiers) of training. How the teachers gained gradual development in understanding and attitude was explored too. The exploration of teachers' uses of AR as a problem-solving tool in practice required detailed descriptive data. Thus, the study employed a mixed method research approach (Teddlie & Tashakkori, 2009; Creswell & Clark, 2011). The study used the parallel mixed method design in which both quantitative and qualitative data were collected simultaneously (Teddlie & Tashakkori, 2009).

A total of 95 secondary school teachers from 20 experimental schools in Bangladesh participated in the teacher professional development program on GIP and practiced AR in their classroom contexts. These 20 schools were selected randomly from all secondary schools in Bangladesh. All the teachers in these secondary schools who are teaching Mathematics, Science, Bangla, and Social Science in grades seven and nine were selected to receive the training.

Data were collected in different stages of the projects using different instruments. First, a pre and posttest of the trainings were used. For each tiers of training, pre- and post-tests were administered to measure changes in teachers' knowledge, understanding, and attitude towards AR of all 95 secondary school teachers. The test items related to AR are a part of a bigger test prepared by the researchers and validated through a series of workshops with relevant experts. The score for the AR part was only 5 marks. The pre and post-test items were the same for a specific tier. However, the test items were different in each tier reflecting what the particular tier of training focused on. These tests were developed to capture the gradual changes in teachers' understanding of AR as an expectation from the trainings. The example of test items includes- "which of the following is the main characteristic of action research?", "Which steps of action research are correct?" (understanding related), and "I think action research can be a great tool for solving my classroom related issues" (yes/no/may be). There were also some open ended questions such as, "What is action research?". Second, data were collected from reflection sessions held during training sessions in which the teachers talked about their experiences of AR. Detailed field notes from the reflection sessions across three training tiers provided qualitative data. Third, the reflective journals of the teachers (17 teachers who volunteered) were also a source of qualitative data in which the teachers wrote down their AR plan, activities, and reflection on the process of AR.

For analysing quantitative data descriptive statistics (Mean and SD) were used to see the results in each tier. Inferential statistics (ANOVA) were used to test if the training had any significant influence on teachers' understanding, and attitudes related to AR. Qualitative data were analyzed thematically (Braun & Clarke, 2006) to gain a deeper understanding of the changes and the process of employing AR to mitigate problems when practicing GIP in their classrooms.

Alpha numerical codes were used to refer the participants' statements. Here, *S* stands for school, and 20 Schools were coded as S1-S20. Accordingly, *T* stands for teachers and numerical number 1, 2, 3 etc. were used with their codes according to the number of participating teachers in a school. Subject codes such as *Ba* for Bangla, *Ma* for Mathematics, *Sc* for Science and *SoSc* for Social Science were added to school and teacher code to refer his/her statements. Therefore, S3T1Ba refers to School 3 teacher 1 who teaches Bangla in an experimental school.

A large amount of literature suggests that the researchers need to be aware of the issues related to translating the quotation of the research participants in qualitative research as it directly impacts the validity of research findings (Abfalter et al., 2020; Chen & Boore, 2010). To ensure rigorous translation, we used three techniques- (1) while transcribing the recordings, we transcribed verbatim in Bangla (the original language), (2) While one of the researchers translated from Bangla to English, the two other researchers checked and re-checked the raw and translated data (Hendrickson et al., 2013; Santos et al., 2015). Instead of teacher's name, code number has been used.

Major findings

The study's outcomes show that teachers' knowledge of and attitude towards AR as well as abilities to carryout AR have shifted in positive directions as a result of their involvement in the GIP professional development. The improvement was incremental as it progressed from the first tier to the subsequent ones.

Improvement in teachers' understanding of action research

The project intended to develop participants' general understanding of AR and its purposes in relation to develop their capacity for conducting AR to solve possible teaching-learning related issues rather than expanding their theoretical knowledge of AR in a broader scale. Qualitative data analysis shows that the participants were familiar with the term 'Action Research' (AR) as they have received professional development training or in-service training from time to time, and AR has also been discussed in some of the training programs. However, in the pre-test just before starting off tier 1 training, almost all participants except 6 teachers were found to have trouble expressing their understanding of AR, its purposes and importance to make teaching-learning effective during the training session. The designated boxes in 9 scripts were found blank, and the answers in the rest of the scripts were found either in a few words or hardly in one or two sentences but those could not make sense clearly. The answer in 6 scripts helps to grasp that those teachers possess understanding of AR more or less. From both pretest open ended questions and training session observation, we found that the initial understanding of almost all participants about concept and purposes of AR was not clear and well-articulated before the project's intervention.

Qualitative data evidenced that the project's intervention developed all participants' knowledge and understanding of AR gradually in relation to their classroom teaching-learning although they could not grasp all items related to AR in a similar manner. The majority of the participants (82 out of 95) comprehended the items related to AR in tier 1 and tier 2 while a smaller number of participants (64 out of 95) were prompt to express their understanding about the items related to AR in tier 3. However, after receiving the training in all three tiers, a significant number of participants (56 out of 95) expressed their views alike the content related to AR presented in the training manuals, in their own words. For example, two teachers' views about AR have been presented in Table 1.

Table 1

Teachers' gradual improvement of understanding about action research

Before intervention	After Tier 1	After Tier 2	After Tier 3
<p><i>"Action research is one kind of research for data collection and analysis" (S3T1Ba)</i></p> <p><i>"Action research helps teachers to find out problem" (S7T1Ma)</i></p>	<p><i>"Action research is helpful for teaching" (S3TBa)</i></p> <p><i>"Action research helps teachers to solve problem" (S7T1Ma)</i></p>	<p><i>"From my recent practice, I grasped AR as a process of identifying and solving classroom problems." (S3T1Ba)</i></p> <p><i>"AR is a tool for solving institutional problems including my classroom problems." (S7T1Ma)</i></p>	<p><i>"AR is a continuous process of identifying and solving problems for improving situations in our own contexts" (S3T1Ba)</i></p> <p><i>"..... Action research plays a very crucial role in teachers' professional development also, which empowers them as teacher and researcher" (S7T-1Ma)</i></p>

The quantitative results show similar development in teacher's understanding. The difference between the average scores of AR related items in the pre- and post- training tests in each of the four tiers further show an increase from pre to posttests (see Table-2), except the first tier. This may be because of the reason that many of the concepts of AR were problematized in this tier, which were clarified and tested not in that tier but in the next tiers. The post tests of the four tiers also show improvement of teachers' understanding related to AR, except the mean in tier 3. This may be explained by the fact that, in this tier, teachers were exposed to much complex content than the other tiers and many of the teachers' were struggling with their final conceptualization regarding AR.

Table 2

Pre and posttest results in different tiers of trainings regarding teachers’ understanding of AR

Training phases	Teachers’ understanding of AR			
	Pre-test		Post-test	
	Mean	SD	Mean	SD
Tier-1	2.470	0.998	2.390	1.240
Tier-2	2.368	1.042	2.632	0.990
Tier-3	2.084	0.808	2.347	0.782
Tier-4	2.095	0.800	2.432	0.846

However the one way Analysis of Variance (ANOVA) showed no significant difference among the average scores in the posttests of the four tiers $F(3, 376) = 1.33, p > .05$.

Teachers’ attitude towards practice of action research

The qualitative data that captured the voices of the participants through reflection sessions and their reflective journal were in unison to the quantitative data. As revealed in Table 3, teachers’ attitude towards practice of AR before and after the training of tier 1 and tier 2 was mostly challenge-focused including personal issues; socio-cultural and religious influences; and system or management-dependent issues. However, because of hands-on-practice of several cases of AR in the training sessions of tier 3 and tier 4 and for the continuous follow up and clarification of misconceptions, a good number of teachers gradually improved their attitudes towards the requirement of conducting AR for addressing classroom-based challenges.

Table 3*Gradual improvement of teachers' attitude towards practicing action research*

After training of Tier 1 & Tier 2	After the training of Tier 3, 4 and follow up
<p>Personal issues: Lack of sufficient knowledge and confidence, Lack of (personal) time, involvement in family affairs, etc.</p> <p><i>I do not possess sufficient knowledge and confidence to conduct action research independently. It is also difficult for me to manage the time required for conducting action research due to class load.” (S1T1Ba)</i></p> <p><i>“Implementation of action research for ensuring gender-inclusive teaching-learning has not been practiced rigorously in schools because of many reasons. We, the teachers, are responsible on one side. We need to spend time planning and preparation. But we are used to spending time with family affairs after coming back to home. On the other side, they are not getting the proper supports and facilities.....” (S11T1Sc)</i></p>	<p>Enhanced confidence: Teachers' views focus on their confidence to conduct AR as tool to mitigate problems in their own capacities:</p> <p><i>“After receiving the training, I am becoming confident gradually. We have many limitations. Yet, I think that I should start action research, at least at a small scale whatever is possible to solve. I am planning to conduct my first research how I can maintain attention of all students throughout the contact hour irrespective of their gender.” (S1T1Ba)</i></p> <p><i>“This training has widened my understanding about action research. In fact, I did not think earlier to conduct action to solve classroom problems whatever possible for me. even, when I received training for the first phase. I had no clear ideas and confidence for conducting action research. Now I am thinking to conduct action research to bring the absent students in my classroom.” (S11T1Sc)</i></p> <p><i>“Earlier, I did not think about solving problems related to my classroom teaching-learning by conducting action research. I was used to inform the problems to the head teacher sir. However, the training at different phases of this project has motivated me a lot. Several boys and girls remain absent frequently from my classroom. Their learning performance is also not satisfactory. I can try to do something better for them through action research.” (S19T1Ma)</i></p> <p><i>“There are 2 special need students in my classroom. Before participating in the training program, I was used to teaching traditionally and I was not so conscious about their learning. But nowadays, I always think about their learning progress. I realize that they need something special treatment for better learning. I have already discussed this matter with the coordinator sir. He has given me important instructions. I shall start action research soon for finding out a strategy for their better learning.” (S13T2Ma)</i></p>

After training of Tier 1 & Tier 2	After the training of Tier 3, 4 and follow up
<p>Socio-economic, cultural and religious influences: Some students’ frequent absence and involvement in family affairs/income generation activities due to parents’ low income; social, cultural and religious influence in some cases to conduct group work/project work combining students irrespective of their gender; some low-income families’ tendency of early marriage of their daughters whenever they get an opportunity, etc.</p> <p><i>“Our area is one of the remotes are in Bangladesh. Most of the students are influenced by family and social culture and religious belief. Most parents do not like to our exercise of group work or project work combining boys and girls. They raise various excuses. The girl students also feel shyness in expressing views in those groups. Therefore, practicing gender-friendly and inclusive pedagogy is a challenge for us. Such challenge may occur if I conduct action research for exercising gender-friendly and inclusive pedagogy” (S19T1Ma)</i></p> <p><i>“Lack of awareness and insolvency of many parents push them to involve their children in family work or income generation activities. As such, they remain absent from school. In this context, it is very challenging for me to bring them into classroom through action research.” (S6T1Sc)</i></p>	

After training of Tier 1 & Tier 2	After the training of Tier 3, 4 and follow up
<p>Large size classroom, insufficient infrastructural facilities, limited contact hours, lack of training. etc.</p> <p><i>“Our habits of practicing traditional pedagogy, religious beliefs and social culture are the barriers to some extent in our locality to exercise some strategies of inclusive teaching-learning in schools. On the other hand, large classroom size and limited contact hours is a challenge for me to conduct action research for their inclusive learning,” (S2T1Ba)</i></p> <p><i>“Exercising action research is not possible in the current situation and environment of the school if its infrastructural facilities are not improved, teachers’ class load is not lessened and their financial support is not increased. Moreover, effective training and close monitoring are needed.....” (S5T1Sc)</i></p> <p><i>“The school culture should be developed in such a manner so that the teachers can conduct action research for gender-friendly and inclusive teaching-learning. The higher authority will ensure this environment with all necessary requirements. I have got training on action research. Still, I have personal limitations. At the same time, my school culture does not compel me to practice it. Therefore, initiatives from all corners are needed for teachers’ practice of action research.” (S20T3SoSc)</i></p>	
System or management-dependent issues:	

The difference between the average scores of attitude towards AR related items in the pre- and post- training tests in each of the four tiers show an increase (see table-4). The post tests of the four tiers also show gradual improvement of teachers’ attitude related to AR.

Table 4

Pre and posttest results in different tiers of trainings regarding teachers' attitude towards AR

Training phases	Teachers' attitude towards AR			
	Pre-test		Post-test	
	Mean	SD	Mean	SD
Tier-1	1.842	0.589	1.884	0.634
Tier-2	1.800	0.612	1.947	0.690
Tier-3	1.811	0.607	2.021	0.743
Tier-4	1.821	0.601	2.074	0.815

However, the one-way Analysis of Variance (ANOVA) showed no significant difference among the average scores of the posttests of the four tiers $F(3, 376) = 1.33, p > .05$.

Teachers' practice of action research

A total of 17 AR were conducted by 17 secondary school teachers after receiving training at Tier 3 and Tier 4. Among 17 AR, eight were conducted by individual teachers in eight schools. The remaining nine AR were carried out in nine schools with the support of their colleagues, who were also involved in the project. We have categorized the problems that the teachers attempted to solve while implementing GIP in their classrooms using AR. Table 5 shows the six problem categories, the strategies used to conduct AR, and the outcomes of their AR.

Table 5

Action research conducted by the teachers

Problems	No. of teachers working with this problem	Strategies and outcomes
Students' frequent absenteeism	2 (Individually: 01 With support of the colleagues: 01)	Strategy used: parent counseling, student cabinet Outcomes: few students became regular, others' absenteeism decreased too
Students' lack of participation in classroom activities	3 (Individually: 01 With support of the colleagues: 02)	Strategy used: using experiential learning cycle, collaborative T-L methods Outcomes: participation increased in group work, but not at equal level for all students

Lack of girls' participation in classroom activities	3 (Individually: 02 With support of the colleagues: 01)	Strategy used: gender transformative T-L strategies Outcomes: More girls are now participating in planned classroom activities
Lack of special need children's engagement in class	2 (Individually: 01 With support of the colleagues: 01)	Strategy used: differentiated T-L methods and learning materials Outcomes: special need children's engagement increased to some extent
Students lagging behind in their learning achievement	4 (Individually: 02 With support of the colleagues: 02)	Strategy used: special coaching and peer tutoring. Outcomes: No significant outcome yet
Large classroom management difficulties	3 (Individually: 01 With support of the colleagues: 02)	Strategy used: group formation and randomized presentation. Outcomes: More organized classroom, disciplined students and learning-friendly environment.
Total	17: (Individually: 08; with support of the colleagues: 09)	

Challenges: Making the change sustainable

Most of the teachers in their reflective journal mentioned the completion of their AR under the guidance of the project team, as a success. Several teachers wrote about their increased understanding, motivation and confidence to conduct AR as the project's contribution to their personal and professional development. However, the discussions with the teachers in the follow up meetings and their reflective journals disclosed that they were able to conduct the AR mainly due to continuous communication, monitoring and encouragement of the project team. Most of them expressed their worries that they might not be able to continue AR after the completion of the project period. The teachers are usually oriented with the fundamentals of AR in their professional development training programs or in-service training programs organized by the Government authorities. Nevertheless, they, during the training sessions, mentioned that they practiced it seldom as this culture was is not established at the secondary schools in Bangladesh and such continuous support and monitoring were is not always present. One participant in the training session said, "this project created evidence that teachers have potential and they can conduct AR if they remain under close contact, and are guided, encouraged and monitored the way the project team did". Therefore, we can conclude that without ensuring this kind of support, it will be difficult for the teachers to continue the practice of AR at least in the

beginning. In other words, the teachers under this project may not continue the practice of AR after the project period as they will not get any academic urge from the project team or conventional academic management and supervision authority. Therefore, the sustainability of teachers' practice of action research is at stake.

Discussion

According to UN's (2015) SDGs, ensuring inclusive and equitable quality education is a global commitment, where gender sensitive, inclusive and effective learning environments for all in school setting have been paid significant attention. This paper aims to explore how GIP training can influence teachers' understandings, attitude, and practice related to AR. This paper also explores how secondary school teachers of Bangladesh can use AR as a tool to solve possible challenges in applying GIP in teaching-learning practices. In the literature, it is evident that AR has huge potentials for teachers' professional development (Al-Mahdi, 2019; Ayaya, Makoelle, & van der Merwe, 2020; Miedijensky, & Sasson, 2022; Ngwenya et al, 2021; Sato, Mutoh, & Kleinsasser, 2022; Wakeman et al, 2022). Many authors and academics contend that AR can help teachers implement inclusive education more effectively in the classroom. (Armstrong & Moore, 2004; Connett, 2020; Ayaya, Makoelle & Merwe, 2020). Generally, findings of this study clearly compliment the evidence of previous research related to the potentials of AR for teachers' professional development. However, teachers' professional development using AR as a tool to solve problems related to GIP practices in Bangladeshi secondary schools provides new insights related to AR, teachers' professional development, GIP, and more broadly quality education as mentioned in UN's (2015) SDG4.

According to Kennedy (1997), knowledge creation that is personally relevant and meaningful is one of key benefits of AR. Additionally, it helps teachers to better understand how they conduct their own teaching (Kincheloe, 2003). The analysis shows that teachers identified different problems related to GIP practices in their own context of the schools and produced meaningful and relevant strategies through AR to solve the problems. While their understanding at the beginning of the project about AR was very limited, their participation in AR changed not only about their understanding of AR but also their attitudes on how they could practice AR in their local school contexts. Goodnough, (2011) points out those teachers become more aware of the diverse learner's needs through AR. In favor of AR, evidence also suggests that teachers can build their confidence and gain stronger knowledge of pedagogy and curriculum (Goodnough, 2011; Rock & Levin, 2002). Analysis of this study indicate that teachers became more aware of the students who lagged behind in their learning achievement, who have special needs as well as becoming aware of students from gender perspectives. Similarly, teachers' knowledge of pedagogy as prescribed in the National Curriculum Framework 2021 of Bangladesh (NCTB, 2021) have been increased which was evident through the practices of experience-based learning and collaborative teaching learning methods by the teachers.

According to Bradbury and Reason (2003), “the core concern for action researchers is to develop practical as well as conceptual contributions by doing research with, rather than on people” (p. 156). This study demonstrates how the research team conducted this collaborative AR with the school teachers of Bangladesh and ensured conceptual and practical contributions towards GIP practices rather than just conducting research on teachers’ GIP practices only. So, it could be an example for researchers who may get interest to identify educational problems as well as solving problems through AR. Mertler (2013) argues that teachers “tend to be intimidated by the thought of conducting their own classroom research” (p. 41) and they ought to get trained in AR from someone who is knowledgeable about and has gone through the procedure. Analysis has been shown how this statement is relevant in Bangladesh context. As a part of the project all seventeen teachers who practiced AR in their classrooms to address different issues or challenges using GIP pedagogy received training on AR. Findings suggest that teachers’ training on AR have potentials to develop their gradual understanding and practices of AR. Aiming to ensure human rights (HR) through education, UNESCO (2011) emphasizes the need to establish a connection between research and policy that facilitates the discovery of shared issues and challenges as well as the creation of workable and efficient solutions. Promoting gender equality, equity and inclusion through teaching-learning practices is deeply rooted from HR and findings suggest that while teachers developed their capacity to use AR as a tool, they identified several issues related to GIP as well as some possible solutions. Thus, this study shows an example of how connection between research and policy can be established in secondary school context in Bangladesh.

Recommendations and conclusion

This study shows that trainings on AR with continuous mentoring and support with encouragement and troubleshooting, and sharing opportunities with other teachers can help the teachers to build better understanding of, more positive attitude towards, and better practice of AR. However, how the knowledge, skills, motivation, willingness, attitude, and practice can be sustainable needs further research. However, we see that a significant number of teachers could not overcome personal and system-dependent issues yet in relation to conduct AR. To make the practice of AR sustainable, we suggest creating professional Learning Circles (PLC) among teachers in different localities who can share, help and collaborate in each other’s AR.

The policy and decision-making stakeholders should take pragmatic actions for solving the system or management-dependent issues regarding infrastructural facilities, workload, large size classroom and limited contact hours, one shot nature of teachers’ training, creation of congenial and favorable school culture, etc. In practice, these issues are not possible to solve overnight. A mid-term action plan could be effective for resolving these issues. The study provides valuable insight that can be particularly helpful for a new action plan for teachers’ career and professional development being prepared by the National Academy for Educational Management (NAEM) of Bangladesh.

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