

Elementary Teachers' Professional Competencies to Meet Educational Innovations: An Analysis of Three Educationally Backward Districts

Arnab Kundu¹ and Kedar Nath Dey²

¹Research Scholar, Bankura University, West Bengal, India,
<https://orcid.org/0000-0002-7169-7189>

²Assistant Professor, SDDK Mahavidyalaya, West Bengal, India
¹arnabkundu5@gmail.com
²Kdey975@gmail.com

Abstract

The professional capacity of elementary school teachers has always been one of the decisive factors in maintaining the quality of education. Unfortunately, many teachers working in remote elementary schools in a developing country like India have not yet adequately responded to the increasing demands of educational innovation. This study investigated the status of the professional competencies of these teachers to meet educational innovations in three educationally backward and underprivileged districts. The study followed a mixed-method approach, combining both the quantitative (questionnaire investigation) and the qualitative (observation and in-depth interviews) approaches, randomly taking 300 elementary teachers as participants. Findings revealed that teachers in these areas still have the limited professional capacity to implement educational innovation such as: using foreign languages or ethnic languages and applying information technology in organizing the effectiveness of educational activities. The four vital factors considered for the professional development of the teachers were found positively correlated to each other which points out the melodious presence of all these factors through suitable planning and thereby creating a better learning future for the students of these far-flung schools.

Keywords: Professional competency, Educationally backward, Innovation, Elementary teacher

1. Introduction

Learning is not learning if a formative shift in one's cognitive schema has not occurred and teaching is not teaching if one has not learned [1]. The fourth industrial revolution is happening quickly, and strongly, making a profound impact on every sphere of life- social, economic, cultural, and moral. In this digital age, the role of teachers and learners in the academic arena has gone through drastic changes. Don Tapscott [2] in his book '*Growing Up Digital: The Rise of the Net Generation*' notes that we are entering a new era of digital learning in which we are in the process of transitioning from "broadcast" learning to "interactive" learning meaning today's students no longer want to be passive recipients in the

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information transfer model of learning rather they want to be active participants in the learning process. Currently, most countries in the world are aware of the impact of educational innovation on all areas of social life [3]. "It is widely believed that countries' social and economic well-being will depend to an ever greater extent on the quality of their citizens' education: the emergence of the so-called 'knowledge society', the transformation of information and the media, and increasing specialization on the part of organizations all call for high skill profiles and levels of knowledge and hence, today's education systems are required to be both effective and efficient, or in other words, to reach the goals set for them while making the best use of available resources" [4]. According to the Organization for Economic Cooperation and Development (OECD) report, "the pressure to increase equity and improve educational outcomes for students is growing around the world" [5]. But educational reforms remain ineffective and will doom to fail if they are not supported by the apposite culture and values behind these structural changes [6]. On a similar note Fullan, Lieberman, and Schoen said that the imaginary government reforms at the system level only superficially change the conditions in educational institutions and do not penetrate deeply into the fabric of institutions resulting in wide gaps between policy intent and policy impact [7][8][9]. They further warned that quality changes in education occur by changing the structure and atmosphere in educational institutions, which they call changing the culture of the institution which requires careful reflection and self-criticism of one's cultural prejudices and what different concepts of culture can divulge or hide [10]. Hopkins [11] extended this notion and said that the overall educational practice reflects the teachers' implicit theories, so 'a change of this practice can only happen as a result of clarity and coherence in the mentality of the teacher'. Fleming et al., [12] said, schools will not improve until teachers begin to collectively explore new concepts of teaching, question the effective practice, and actively support each other in their professional growth. Vujicic et al., [13] said one of the key ways in which we can achieve this quality change in the fabric of institutional practice is through a transformation of professional development of teachers which is an important lever in changing the entire culture of the institution. Zhu et al., [14] said teachers' educational competency, social competency, and technological competency were positively related to their innovative teaching performance. To realize this goal in educational innovation, the capacity development of elementary teachers has an important role which is influenced by many factors like education, efficacy, infrastructure, encouragement, training, socio-economic condition, positive governmental interference, intent, etc. However, there are not many in-depth studies or analyses of the professional capacity of elementary school teachers in these educationally backward areas, living behind the limelight of mainstream development.

2. Literature review

2.1. Educational innovation needs professional development

Many researchers believe that one of the decisive factors in the effectiveness of educational innovation is the development of teacher professional competencies [15]. Innovations in education are of particular importance because education plays a crucial role in creating a sustainable future. "Innovation resembles mutation, the biological process that keeps species evolving so they can better compete for survival [16]". Innovation, therefore, is to be regarded as an instrument of necessary positive change and to improve teachers' professional capacity; it is necessary to start with training, recruiting, and retraining teachers

[17]. Nguyen [18] found it clear that "Comprehensive fundamental innovation of education and training is to innovate big, core, and urgent issues, from the point of view of direction to objectives, content, methods, mechanisms, policies, and conditions to ensure implementation; innovating from the leadership of the Party, the management of the State to the governance of education and training institutions and the participation of the family, community, society, and learners themselves, new in all levels of study, disciplines. Recognizing the importance of career capacity development in educational innovation, many researchers focus on analyzing the core issues of professional capacity such as the teacher's role in educational innovation, developing soft skills to improve the professional capacity of teachers, the importance of social and emotional competencies for the education of children with special needs [19][20]. In addition, the necessary competencies of elementary teachers in educational innovation are also mentioned as integration capacity and artistic ability [21][22].

Most studies showed that teacher education reform is an important key to educational development, and teachers are the significant factor that makes a developed society. Currently, the improvement of people's living standards and the requirements for quality elementary education are getting higher and higher, and the key factor to improving the quality of elementary education is the improvement of the quality of elementary teachers throughout the Asian region and surrounding globe [23][24]. The working environment in elementary schools also affects the professional development of teachers [25]. Vujicic et al., [13] said the culture of the educational institution is an expression of common, basic settings, teachers-assistants- administrative-support staff's, parents', and principals' beliefs, which are characteristic for the operation of educational institutions and are identified by mutual relationships among people, their collaboration, management of the institution, organizational and physical environment, and the degree of focus on teaching and research. The correlation between the qualifications and the quality of elementary teachers will strongly affect the quality of education mandating qualified teachers may lead to significant improvement for both process and structural quality education [26]. The professional development of elementary teachers is an activity procedure of continuous learning of professional knowledge, acquisition of professional skills, and formation of a good professional attitude by elementary teachers to achieve their professional development goals [27]. Comprehensive education reform needs to determine the professional qualifications of teachers, and clearly define the professional standards that elementary teachers need to achieve [28]. To meet education innovation, one of the important career capacities that educators need is the ability to apply information technology in the process of organizing educational activities for elementary students [29].

Elementary education is the first level of education in the national education system, so elementary teachers' professional development has a big role in the educational innovation of the state, and hence, developing the professional competencies of elementary teachers is a top priority [23]. For teachers in underdeveloped and unfavorable areas, it is necessary to develop this capacity for them, helping them to realize the important role in promoting this educational development [30]. The professional capacity development of elementary teachers includes the following groups of competencies: ethical competence; professional development capacity; capacity to organize educational care activities; child assessment capacity; the capacity to build a safe, strong, and friendly environment; capacity to coordinate in child care and education; competitiveness and integration [31]. Professional competency standards of elementary teachers include the following standards: teacher quality; professional development; building an educational environment; developing relationships between school, home, and community; using foreign languages (or ethnic tribal languages),

applying information technology, and demonstrating artistic ability in child nurturing, caring and educating activities [32].

2.2. Description of educationally backward districts

The Government of India has identified 374 Educationally Backward Districts (EBDs) having Gross Enrolment Ratio (GER) lower than the national GER for higher education. Similarly, 3500 Educationally Backward Blocks (EBBs) have been identified in the country showing poor performance in all parameters in educational development like poor quality of instructional delivery, the poor pool of institutional educational infrastructures, bopping rote learning, poor professionalism among teachers, poor attitudes towards educational innovations especially technology integration, lack of teachers efficacy in adapting innovations, and overcrowded classrooms with teacher dominated age-old pedagogies [33]. At present India has a total of 6701 blocks of which 3453 are educationally backward as per the Department of School Education and Literacy under the Ministry of Human Resource Development [33]. Educationally backward blocks mean a block where the level of Female Literacy Rate is below the national average of 46.13% and the Gender Gap in Literacy is above the national average of 21.59% [34]. The educationally backward blocks constitute 51.5 percent of the total blocks in the country and 74 percent of such blocks are concentrated in the nine states viz. Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, West Bengal, and Uttar Pradesh [35].

Education is critical for the sustainable development of any country as it raises people's productivity and enables the socio-economic empowerment necessary for an inclusive and sustainable growth process [36]. The multi-pronged education strategy implemented through the Right of Children to Free and Compulsory Education Act [37], Sarva Shiksha Abhiyan, Mid-Day Meal Scheme, Rashtriya Madhyamik Shiksha Abhiyan, etc., has enabled India to achieve a gross enrolment ratio of 98 percent for those in the age group of 6-14 years, but the concern regarding quality and equity in education is still a burning issue in the country that has been stressed in the Sustainable Development Goal 4 [38]. The global education development agenda reflected in Goal 4 (SDG4) of the 2030 Agenda for Sustainable Development [39] adopted by India in 2015 seeks to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." Such a lofty goal will require the entire education system to be reconfigured to support and foster inclusive learning so that all of the critical targets and goals (SDGs) of the 2030 Agenda for Sustainable Development can be achieved [23].

In this circumstance, a probe into the numerous underprivileged elementary school teachers' professional competencies to meet educational innovations is very timely and pertinent, and more importantly, such underdeveloped terrains were frequent and common in many countries across the globe, especially in those developing countries that makes this study globally significant.

3. Conceptual framework

A general definition of professional competency is the level of integration of knowledge, skills, and attitudes [40]. Koster et al., [41] have put forth a few of the teachers' generic competencies or competencies for teacher professional development like 'Pedagogical skills', 'Knowing the Student', 'Monitoring and Evaluation of Learning and Development', 'School-Family and Society Relationships', 'Knowledge of Curriculum and Content', 'Teamwork', 'Communication', 'Problem-solving', and 'Understanding the culture'. Besides teachers' field

competence, research competence, curriculum competence, lifelong learning competence, social-cultural competence, emotional competence, communication competence, information and communication technologies (ICT) competencies, and environmental competencies as general teacher competencies are also proposed in several studies as important competencies [42][43]. Several studies summed up those competencies into four broad categories for innovative teaching-learning competency, social competency, educational competency, and technological competency [44][45][46]. Some studies have identified different instrumental factors affecting teachers' professional competencies like working environment [47], teachers' knowledge of students' achievements [48][49], innovation in teaching methodology [50], attitudinal variables, and motivational variables for implementing a specific task or work [51], integration of "knowledge and understanding, skills, and abilities, teachers' beliefs, and moral value" [49], cognitive characteristics, for example, intelligence or thoughtfulness [52][53], experience [54], school leadership and collegial co-operation [55], geographical and eco-social factors, teachers' linguistic ability [56], socio-economic condition of the area [57], teacher learning at the workplace [58], etc. Based on the conceptual framework for the core competencies the researchers have determined four factors affecting the professional capacity development of elementary teachers to meet educational innovation presented in [Figure 1].

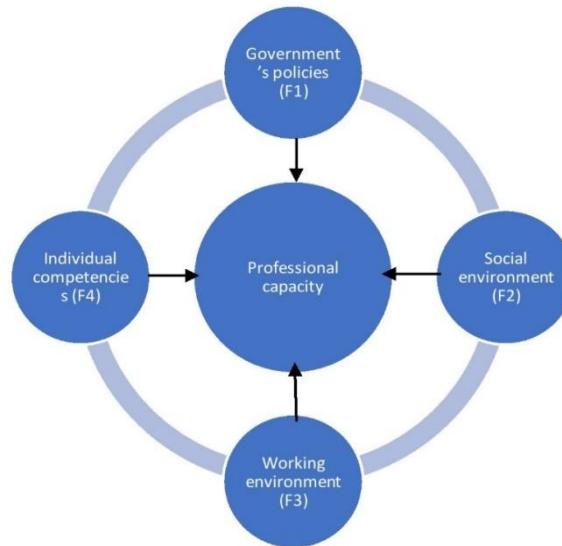


Figure 1. Proposed four factors affecting the professional capacity of elementary teachers

This study followed a mixed approach combining both quantitative (e.g., questionnaire investigation) and qualitative (e.g., observation and in-depth interviews) methods. The details regarding samples, research design, tools, the procedure of data collection, and statistical technique were reported herewith.

4. Research objectives

This investigation aimed at finding the status of some of the required professional competencies among elementary school teachers in underprivileged areas and the factors affecting it to meet educational innovations in the current context. This study focused on the following research questions (RQ):

RQ1: How was the teachers' awareness of the need for professional capacity building?

RQ2: What was the state of the professional capacity of teachers in these disadvantaged areas?

RQ3: Which factors had been affecting the professional capacity development of teachers?

RQ4: How did these factors correlate with each other?

5. Methodology

A mixed-method approach has been up in this study combining both the quantitative (questionnaire investigation) and the qualitative (observation and in-depth interviews) method of data analysis. The quantitative data collected on a random sampling has been analyzed using parametric statistics and to verify the findings qualitative approach of the limited interview has been used.

5.1. Sites and participants

This study was delimited within the three educationally backward districts-Bankura, Purulia, and Paschim Medinipur- in the state of West Bengal in eastern India, ideally representing the country in several aspects like having huge population density, low educational penetration in rural areas, low women education rate, poor quality of education, schools having a very poor pool of educational infrastructures, bopping rote learning, and overcrowded classrooms with teacher dominated age-old pedagogies and having 74 (seventy-four) socio-economically depressed and educationally backward blocks including 24 (twenty-four) Left Wing Effectuated blocks [59] in five districts namely Bankura, Purulia, Birbhum, Burdwan, and Paschim Medinipur equally having an audible tribal population, low female literacy, and poor academic infrastructure. The study was conducted taking randomly 300 teachers out of 100 government-aided elementary schools popularly known as primary schools having grades one to five. The actual names of the participants were withheld following the research ethics. Detailed demographic data of the participants were presented in [Table 1].

Table 1. Demographic information of the participants

Variables	Frequency	%
<i>Gender</i>		
Male	250	83.3
Female	50	16.7
<i>Teaching grades</i>		
Elementary (Grades I-V)	300	100
<i>Academic qualification</i>		
Higher Secondary	110	36.7
Graduate	120	40
Post-graduate	70	23.3
<i>Teaching Experience</i>		
1-10 years	77	25.6
11-20 years	153	51
Above 20 years	70	23.4

5.2. Research tools

5.2.1. Questionnaire

Three researchers-made survey questionnaires were used for data collection. The first questionnaire was on 'Awareness of elementary teachers on the need for professional capacity development' having eight domains each attached with a four-point Likert scale (4 for "very necessary", 3 for "necessary", 2 for "less necessary" and 1 for "not necessary") to measure participants' perception over each domain with higher scores indicating higher awareness level in the concerned domain. The second questionnaire was on the 'The status of the professional capacity development of elementary teachers to meet education innovation' having six domains each attached with a five-point Likert scale (5 for "good", 4 "fair", 3 "average", 2 for "weak", 1 for "poor") with higher scores indicating the higher professional capacity level in the concerned domain. The third questionnaire was on the 'Factors affecting the professional capacity development of elementary teachers to meet educational innovation' having four domains each attached with a four-point Likert scale (4 points for "much influence", 3 for "influence", 2 for "little influence" and 1 for "no influence") with higher scores indicating deeper effect in the concerned domain. Since these were self-developed questionnaires, their Validity was determined through a concurrent validity measure (a type of Criterion validity) by experimentally applying to a limited number (50) of participants and the Pearson Correlation (r) was 0.87, 0.83, 0.91 respectively. The Internal Consistency Measure (Cronbach's α) was .91, .89, .93 respectively which were of excellent degrees.

5.2.2. Interview

Additionally, a total of 30 teachers were interviewed by the researchers to gain an in-depth understanding of their perception of several issues regarding professional competencies to meet educational innovations based on a set interview protocol and their opinions served the purpose to verify the data gained through questionnaires. The participants were allowed to choose their preferred time and language for the interview. Interviews were audio-recorded and then transcribed. The protocol focussed on these three open-ended questions:

1. Do you think you have adequate professional skills for innovative teaching?
2. What problems do you feel affecting your teaching potential?
3. Do you get adequate support from school for your teaching?
4. What is your suggestion for more effective teaching in your school?

5.3. Data collection and analysis

A pilot version of the surveys was initially administered to a limited number of respondents with different characteristics to establish the effectiveness of the designed tools. Testing the survey design helped ensure that the used terms were easily perceived, as well as to check for validity (i.e., the items were asking what we wanted to learn) and consistency. As the study was conducted during the lockdown period of social distancing, researchers used both offline (face-to-face) and online platforms (emails, telephonic interactions) for data collection. The data collected through the survey were processed using Statistical Package for Social Science 20.0 software to produce the main research results.

6. Results

6.1. Results of RQ1

Survey results reported in [Table 2] show that the survey participants are well aware of the need for professional capacity development for elementary teachers in the current situation.

Table 2. Teachers' awareness of the need for professional capacity development

No	Professional competencies	N	Mean	Std. D.
1	Using foreign languages (English priority) or ethnic languages	300	3.72	.679
2	Applying information technology	300	3.81	.475
3	Educating for child's development	300	3.82	.387
4	Artistic ability	300	3.83	.374
5	Collaborating with their parents or guardians to improve the quality of child nurturing, care, and education	300	3.86	.351
6	Assessing the child's development	300	3.87	.335
7	Planning for nurturing, caring, and educating children towards comprehensive development.	300	3.88	.331
8	Nurturing and taking care of children's health	300	3.88	.323

Among the capacities surveyed, nurturing and taking care of children's health and planning for nurturing, caring, and educating children towards comprehensive development is most appreciated (Mean=3.88), Assessing the child's development; and collaborating with their parents or guardians to improve the quality of child nurturing, care, and education have lower ratings. In addition, the research results show that other career competencies such as applying information technology and using foreign languages (English on priority) or ethnic languages have lower scores than all surveyed competencies. Thus, all survey participants are well aware of the need to develop the professional capacity of elementary teachers, especially, teachers of tribal schools; still, the survey areas show many unfavorable conditions in developing their professional capacity.

Table 3 presents the division of teachers' awareness levels depending on the chosen demographic information that shows female teachers harbor better awareness levels than their male counterparts.

Table 3. Division of teachers' awareness level

Variables	Mean	Std. D
Gender		
Male	12.5	1.3
Female	15.1	1.7
Academic qualification		
Under-graduate	7.8	1.4
Graduate	9.9	1.4
Post-graduate	11.2	1.3
Teaching Experience		
1-10 years	7.7	1.6
11-20 years	10.3	1.7
Above 20 years	12.1	1.4

The t-test result ($t=1.39$, $p= 0.009<0.01$) in Table 4 further reveals that this difference is statistically significant meaning there are reasonable facts than being a mere chance.

Table 4. t-test comparing awareness between male and female teachers

	N	Mean	SD	t-cal	t-crit	df	p	Decision
Males	250	12.5	1.3	1.39	.65	249	0.009*	Reject
Girls	50	15.1	1.7					

$p= 0.009<0.01$

Besides [Table 3]presents a considerable difference in awareness levels among teachers of different academic qualifications where post-graduate teachers showed the highest awareness level followed by the graduate and undergraduate teachers. This perceptual difference was again found statistically significant as per the one-way ANOVA result ($*p=0.0019<.01$) in [Table 5].

Table 5. ANOVA comparing awareness among teachers of different academic groups

	Sum of Squares	df	Mean Square	Calculated F	Sig. (p)
Between groups	238.85	3	1112.95	.16	0.0019*
Within groups	1673.64	192	13.62		

$*p=0.0019<.01$

The statistically significant difference in awareness level is found among teachers of different experience groups as well as per the ANOVA result ($*p=0.0001<.01$) in Table 6 which indicates there are reasons behind more experienced teachers harboring higher awareness levels on the need for professional capacity development.

Table 6. ANOVA comparing awareness among teachers of different experience groups

	Sum of Squares	df	Mean Square	Calculated F	Sig. (p)
Between groups	256.5	3	1432.41	.11	0.0001*
Within groups	1433.64	192	11.91		

$*p=0.0001<.01$

6.2. Results of RQ2

The results of the survey reported in Table 7 above show that solutions to develop the professional capacity of elementary teachers in the studied underprivileged areas have been attempted; however, the implementation of these solutions still has some limitations.

Table 7. State of the professional capacity development of elementary teachers to meet education innovation

No	Professional competencies	N	Mean	Std. D.
1	Participating in a workshop on innovation in elementary education	300	1.83	.519
2	Recruiting elementary teachers according to competencies	300	2.64	.785
3	Evaluation of elementary teachers according to professional standards	300	2.80	.858
4	Policy to support elementary teachers in backward areas	300	2.88	.813
5	Creating opportunities for elementary teachers to participate in thematic training	300	2.90	.779
6	Encouraging elementary teachers to improve their professional skills	300	2.97	.736

Looking at the above survey results, it is easy to see that some solutions are not performing well, and some solutions are still at the average level. Out of the six surveyed solutions, encouraging elementary teachers to improve their professional skills is the most valued (Mean = 2.97). Provides opportunities for teachers to participate in thematic training courses (Mean = 2.90) is the next most valued, with the lowest rating that elementary teachers are allowed to participate in seminars on innovation in elementary education (Mean= 1.83) and recruit qualified elementary teachers (Mean = 2.64). This indicates a fairly common situation in elementary schools in these areas. While observing the professional activities of elementary teachers and talking to them about solutions and policies, we find that teachers rarely or never participated in workshops on childhood educational innovation. Besides, many elementary teachers have limited knowledge and skills to care for children. Some studied areas have still an acute shortage of elementary teachers; therefore, the recruitment of teachers is still facing many difficulties. That is the reason why many elementary teachers in underprivileged areas have limited professional skills, and the quality of elementary teachers has not responded to educational innovation.

6.3. Results of RQ3

Based on the above survey results presented in Table 8, the social environment, working environment in elementary schools, government policies, and elementary teachers' competencies all have a direct or indirect effect on the professional capacity development of elementary teachers.

Table 8. Factors of professional capacity development of teachers to meet educational innovation

No	Professional competencies	N	Mean	Std. D.
1	The government's policies	300	3.22	.642
2	The social environment	300	2.93	.843
3	The working environment in school	300	3.11	.803
4	Individual teacher's competencies	300	3.44	.614

The factor that has the greatest impact on the professional capacity development of elementary teachers is elementary teachers' competencies (Mean = 3.44). The professional capacity of elementary teachers is expressed through quality and competencies such as love of the job, love of children, need for learning and fostering, and adaptation to educational innovation. Ranked second are the government's policies (Mean = 3.22), expressed through policies on salaries and allowances, training, recruitment, and rewarding elementary teachers. The working environment in elementary (Mean = 3.11) and the social environment (2.93) are

ranked third and fourth. Thus, in the current education reform, the professional capacity of elementary teachers is affected by many factors. These survey results will provide necessary information for the professional capacity development of elementary teachers in educational innovation to enhance the quality parameters in these elementary schools in a more inclusive fashion.

6.4. Results regarding RQ4

Now knowing the correlation among these effective factors is a necessity and for which the 4th Research Question that reads “*How did these factors correlate with each other?*” was framed. A Pearson’s correlation analysis was calculated with the parametric data and the results are reported in Table 9 that shows considering the correlation coefficient (r) among groups of affecting factors on elementary teacher's competencies, r is in the range from 0.72 to 1.00 and with a significance level of 1%, (sig <0.01). This shows that groups of affecting factors on elementary teachers' competencies have an absolute positive correlation with each other. This result concludes that to develop the professional capacity of elementary teachers in educational innovation, it is necessary to pay attention to all those influencing factors because these factors are significantly correlated with each other.

Table 9. Pearson’s correlation results among four influencing factors

Domains		F1	F2	F3	44
The government’s policies (F1)	Pearson Correlation	1	.820**	.869**	.772**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	300	300	300	300
The social environment (F2)	Pearson Correlation	.820**	1	.894**	.813**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	300	300	300	300
Working environment in schools (F3)	Pearson Correlation	.869**	.894**	1	.786**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	300	300	300	300
Individual teacher’s competencies (F4)	Pearson Correlation	.772**	.813**	.786**	1
	Sig. (2-tailed)	.000	.000	.000	.000
	N	300	300	300	300

** Correlation is significant at the 0.01 level (2-tailed).

7. Discussion

The investigation has found that the practice of professional capacity development of elementary teachers in studied educationally backward areas is not up to the mark. This study has also provided additional findings on educational innovation in the context of the elementary teachers working in the tribal major terrains. Participants in the survey are undoubtedly aware of the need to develop their professional competencies to teach in elementary schools, especially in the stage of educational innovation. They said that these professional competencies have a direct and strong influence on the quality of child care and education in all elementary institutions. This finding is further bolstered during the interviews when one of the interview participants said:

[W]e feel professional competencies would help us to adapt to the rapidly changing educational scenarios globally that we do feel we are lacking especially in our proficiencies in English speaking and computer-oriented teaching.

However, the survey also found that elementary teachers assessed the need for the ability to use foreign languages and apply information technology in organizing activities in elementary lower than other career capacities. This does not mean that they do not appreciate the importance of using foreign languages and applying information technology in organizing educational activities for children in elementary schools. They based this lower assessment of need on their facilities and abilities and immediate goals for the educationally backward children and ethnic children. They think that children in educationally backward areas and ethnic tribal children need special care and education according to the latest methods. Research results of some other authors also have similar points to the results of this study [19]. The need for elementary teachers to apply information technology and use foreign languages is also mentioned in some previous studies [17][18][22]. Thus, educators are positively aware of the professional capacities of elementary teachers in educational innovation. This awareness will affect the perceptions of all teachers in their career development. These awareness levels vary depending on different demographic variables like females showed better awareness levels than male teachers, and more experienced teachers expressed better awareness levels, and this level was found to increase with the increase of teachers' academic levels echoed the finding of [26].

This study examines eight professional competencies of elementary teachers in educationally backward areas that play an important role in the current context. Especially in the face of education innovation, the competency groups selected for this survey have different evaluation results. Most educators themselves find that the capacity to nurture and take care of their well-being and the group of competencies in planning educational activities in elementary is most valued. This result is shown more clearly when observing the activities that teachers organize for children in elementary schools. The application of information technology and the ability to use foreign languages are one of the biggest limitations of elementary teachers today, especially for teachers in educationally backward areas. Directly observing teachers in organizing activities and chatting with them, we realized that to respond to the requirement of educational innovation elementary teachers need to improve their professional capacity to create a highly interactive educational environment that stimulates the interests of learners. Research results of several other authors also mentioned limitations on the ability to use foreign languages and information technology in teaching [17][29]. Thus, the professional capacities of elementary teachers in educationally backward areas are still limited. Many elementary teachers need to be trained and fostered and they have to be more active in their ability development this is also supported by teachers during interviews. One participant teacher's opinion in this context is worth mentioning:

[O]ur professional standards need to be reviewed and revised nationally and centrally preferably every ten years, based on rigorous empirical analysis of the efficacy of the system so that we can get the required boosting for skill development.

Research on solutions to develop the professional capacity of teachers plays an important role in educational innovation today. The results obtained from this study are from participants directly implementing the task of elementary educational innovation and determining the quality of education in the context of underprivileged education. Research results show that to develop the professional capacity of elementary teachers, many solutions

need to be well implemented. However, through the teachers' assessment, the study found that the application of these solutions is currently not good at adding quality education in these backward district areas. In particular, creating opportunities for elementary teachers to participate in seminars on educational innovation and recruiting elementary teachers through competency tests are considered to be at a very low level by teachers. Previous studies also mentioned limitations in realizing some solutions to develop professional competencies of elementary teachers [18][60][61][62]. Encouraging elementary teachers to improve their skills is considered the best practice by teachers today; they think that to improve the quality of education, it is necessary to improve the level of elementary teachers. The findings indicate largely null or contradictory associations, indicating that policies focused solely on increasing teachers' education will not suffice for improving classroom quality or maximizing children's academic gains [61]. Instead, raising the effectiveness of elementary education likely will require a broad range of professional development activities and supports targeted toward teachers' interactions with children. The results of a research team in the USA also show ways to improve the quality of education in elementary classes [63]. The research results will be an important basis for finding the best solutions to develop the professional capacity of elementary teachers in educationally backward areas to meet the education requirements.

In addition, the study analyzed four main factors affecting the professional capacity of teachers. The results of this research make an important contribution to the current education innovation as the basis for the educational renovation in general and capacity development for elementary teachers in particular. Research results showed that education policy, social environment, elementary work environment, and elementary teacher competencies have a great impact on the professional capacity development of elementary teachers. Some factors have direct effects and factors that have indirect effects. Among four factors being researched and implemented, elementary teachers themselves have the greatest influence on their professional capacity development such as knowledge of elementary skills to organize child-centered activities, integration, and competitiveness. Several recent studies have also confirmed the significant effects of environmental factors and government policies on the career development of elementary teachers [31]. The study's impacts on the professional promotion of teachers also showed that teachers are demotivated by extrinsic factors such as heavy workload and low salary which are believed to lead to job dissatisfaction [64]. The results of this study have found that to develop the professional capacity of elementary teachers to respond to educational innovation, it is necessary to consider these four impact factors.

8. Conclusions

In the education reform, many factors are affecting the educational development of a country. If a country wants to develop, it is necessary to invest in education and training, in addition to shortening the educational quality gap between educationally backward areas and urban areas having an educational stronghold. In recent years, India has always been actively looking for solutions to improve the quality of education and training as reflected in its professed declaration in the National Education Policy 2020, from elementary education to general education to higher education. In educational innovation, the professional capacity development of teachers in educationally backward and underserved areas is always the center of focus. Therefore, the purpose of this study is to point out the current status of the professional capacity development of teachers in educationally backward areas, as the basis for the next research project to propose solutions to develop the professional capacity of

elementary teachers meets the requirements of education innovation. The results have shown that the professional capacity of elementary teachers is still limited, especially the ability to use foreign languages and apply information technology in organizing educational activities. In addition, this study investigated perceptions of the need for professional competency development of elementary teachers, and factors affecting teachers' professional competency development. Therefore, the implementation of these survey results will make a great contribution in the context of reforming elementary education in long underprivileged educationally backward areas; where there are many unfavorable conditions for implementing education reform prevails. This study is also the basis for the next research project to propose solutions to develop the professional capacity of elementary teachers in these backward areas, and thereby contribute to improving the quality of education and successfully implementing educational reforms as per the leading point of view of the National Education Policy [23] recently announced by the Indian government.

9. Limitations

The results of this research on the professional capacity development of elementary teachers have clearly shown the situation of child care and education in educationally backward areas. These research contents have shown some limitations in the development of the professional capacity of teachers. However, the limitation of this study is that it has not been able to fully survey all the professional competencies of elementary teachers, but the study only selects some of the most basic competencies, which are easiest for teachers to evaluate and most suitable for the assessment ability of the subjects participating in the survey. In addition, the study only concentrated on three educationally backward districts of a single Indian province and could not expand the research area across India. However, these study results are considered reliable findings in the process of improving the quality of elementary education and developing professional capacity for teachers in educationally backward areas.

10. Futures research and foresight with human development

In a huge developing country providing quality education to its children is always a challenging task owing to several limitations-social, cultural, and economic. Still moving towards this goal is a necessity. Mere certification does not make a good teacher rather a teacher needs a strong will, intent, and scope for constant professional development. To know a teacher and cater to him according to his/her needs is a compulsion for every government. Before that finding out the weakness among them is a pre-requirement and the current study was mainly focused on this issue. The outcome revealed the four factors for professional development for teachers were found positively correlated to each other which points out towards the harmonious presence of all these factors could help a proficient cadre of teachers to teach in schools in these regressive regions. We get this foresight to improve teaching-learning in these schools now the future scope will be directed towards planning measures to strengthen these areas among teachers for their empowerment and thereby creating a better learning future for the students of these regions.

11. Declarations

(1) Availability of data

The data used in this study is kept with the authors and can be availed upon request from any of them.

(2) Funding

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Authors



Arnab Kundu

He has received a Master' in English and in Education, M.Phil. (Education), Post Graduate Dip. in Educational Management and Admin. (PGDEMA). He held the 1st Rank in CUCET-2018 (All India level Ph.D. Entrance Examination in Education) and currently pursuing his Ph.D. at Bankura University, West Bengal, India. He has teaching experience of 12 years & his research concentrates on several issues of teachers' work and teaching presence especially to promote technology-integrated pedagogy. As of now, he has 20 research articles published in SCOPUS/WoS indexed international journals including well-reputed publishers like Springer, Sage, IGI-Global, Emerald, etc. He is the main and corresponding author of this article.



Dr. Kedar Nath Dey

He has been working as an Assistant Professor, at the Department of Education, SDDK Mahavidyalaya, affiliated with Bankura University, West Bengal, India. He has received M.A. and Ph.D. in Education from Berhampur University, India. He has been supervising Ph.D. students in Education at Bankura University and his noteworthy contribution to the knowledge society is reflected through his research papers published in several national and internationally indexed journals. He is the co-author of this research article.