

Educational Change and Teachers' Pedagogical Content Knowledge Integration for Professional Development

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ABSTRACT

The world is passing through a phase of transformational change. The state, the economy, the society and the ecology are changing in ways that have compelled individuals and nations to confront the aeolian question of what we are and what we aspire to be. Education must facilitate human quest in search of answer to this question. And, if education has to serve this purpose, role of the teachers in this regard can hardly be emphasized. A candle has to burn itself to be able to enlighten the path of others. Likewise, the teachers must brace up not only to the emerging discourse in their respective disciplines but also, and, equally importantly to the ways through which it may be possible for them and their students to construct, deconstruct and reconstruct their worldviews and the paradigms of knowledge. Teacher education is a discipline whose prerogative is to innovate and research upon ways towards betterment in education in its various fields such as curriculum, pedagogy, learning, assessment, etc. One of the variables in teacher education that has been very prominent in teacher education researches has been, Pedagogical Content Knowledge (PCK). The underlying contention of the present paper is whether PCK as a construct can in any way prepare our teachers to adapt and deal with the educational change prevailing within their context. For this purpose, a study was carried out with a sample of in-service teachers so as to know about the present notions of educational change amongst our teachers and their own ways of PCK embodies the aspects of content most germane to its teachability. Within the category of pedagogical content knowledge, I include, for the most regularly taught topics in one's subject area, the most useful forms of representations of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations-in a word, the ways of representing and formulating the

subject that makes it comprehensible to others...." (Shulman, 1986).

Educational Change and Teachers' Pedagogical Content Knowledge ...

The results indicated a mixed response in terms of teachers' understanding about educational change per se and their ability to deal with the change, if they happen to identify any. The study has its implications for the pre-service as well as in-service teacher education programmes.

I. INTRODUCTION

"Teaching" and "Pedagogy" are two terms that are very often used in the culture of classroom teaching learning and are so often used synonymously, but they imply very different meanings. Teaching refers to the act of influencing the ideas and knowledge of the learner by creating a bridge of communication that is in conventional terms a one-sided affair. However, pedagogy refers to the 'science of teaching' and not merely an art, as it is deeply embedded in the cognition of the teacher and has come up as a result of years of experience, experimentation and reflection. Thus, teaching represents the behavioral component whereas pedagogy is the psychological component. The behavioral component is easier to assess and report but it is the psychological component that is difficult to explain as well as report. Pedagogy however is not a singular term as it has so many other factors and variables that impinge upon it to give it different meanings for different individuals at different points of time. These other factors can be the teachers' own experience, beliefs, values, knowledge of transactional strategies, curriculum, assessment patterns adopted by the school or individual teacher, as well as school's cultural context and environment. All these factors taken together frame the pedagogy adopted by the teacher in the classroom (Integrated approach). All the above listed components of teachers' knowledge

repertoire have been researched individually by many researchers, but a holistic understanding of pedagogy can only be generated if all these factors are taken together. For the first time it was Shulman in the late twentieth century who coined one term that could coalesce various facets of teachers' knowledge repertoire called as 'Pedagogical Content Knowledge (PCK)'. Soon the term gained significance in the education sector with many researches in this area teaming up to give newer dimensions to it. Although the concept has evolved and many researchers have advocated its significance in effective teaching learning both at school as well as university level, but is still in its infancy in terms of integrating such a component in the curriculum for teacher education. In order to integrate such a component within the teacher education curriculum, a need to link it with some of the broader educational aims and objectives is required. One of the educational aims of the present century is to cater to the present demands of the changing world. The globalized scene today warrants a better-connected educational network for fulfilling the educational requirements of those to whom formal education is inaccessible, besides vocational and technical education have acquired predominance over theory-based education for an independent life style of today.

Therefore, the objective of writing the present paper is to highlight the need and significance of Pedagogical Content Knowledge (PCK) in guiding prospective teachers toward adapting and tackling educational changes happening within a country or globally and hence in transforming the present structure and function of teacher education programmes going on in the country. The two research questions that have guided the present study are as follows.

1. What is the present understanding of our teachers about the changing educational world?
2. Are the classroom transaction processes in terms of content delivered and pedagogy adopted in consonance with the demands of changing world scenario?

II. THEORETICAL FRAMEWORK

"Educational Change" and Its Meaning

In order to understand educational change, we first need to know what we mean by "change". Change can be defined and understood as having various parameters such as ecological change, developmental change, economic change, social change, changing lifestyles, changing technology, changing requirements for food, energy and resources, etc. These are the changes that are

happening in the world or in any country like India. It is seen that one change breeds another, for instance changing life styles have created changing food habits and changing nutritional requirements for people. Similarly, changing requirements for energy, has led to industrial growth, leading to changing ecological and environmental patterns. Now, coming back to "educational change" that is again impacted and affected by phenomena such as changing world picture in terms of globalization and mass communication; changing patterns of growth and economics, as well as changing meanings of learning (Dalin, 1978). All of the above-mentioned factors have created newer realms of teachers' knowledge and more to say this has assigned newer roles and responsibilities to them. Thus, preparing our future teachers to deal with these educational changes should be the task of any teacher education programme. Pedagogical Content Knowledge (PCK) can offer a means as to integrate this educational change in the curriculum for teacher education at the content level, while transforming the same knowledge for teaching and transacting it in the classroom at the process level.

"Pedagogical Content Knowledge" the Construct

The different facets of a teacher's knowledge base were for the first time researched and reported by L. S. Shulman in the year 1986 in his famous work- "Those Who Understand: Knowledge Growth in Teaching" as well as in another famous work in the year 1987- "Knowledge and Teaching: Foundations of the New Reform". The different knowledge bases as discussed above have been integrated into one single whole called as "Pedagogical Content Knowledge (PCK)" but have a cumulative effect on teachers' cognition as asserted by Shulman who also coined the term.

Defining PCK in his own words-

"The category of PCK includes - the most regularly taught topics in one's subject area, the most useful forms of representation of those ideas, the most powerful analogies, illustrations, demonstrations, examples, explanations, and ways of representing and formulating the subject that makes it comprehensible to others. PCK also includes an understanding of what makes the learning of specific topics easy or difficult; the conceptions and preconceptions that students of different ages and backgrounds bring with them to the learning of those most frequently taught topics and lessons."

However, since the introduction of the term PCK many different meanings have been connoted to it, there have been very many debates amongst those in the educational fraternity including teachers, researchers, educational psychologists and curriculum developers. They regard the notion of PCK as highly structured and deterministic, leading to its many modified versions. Some of the points on which the concept of PCK has been critiqued include: Integrated vs. Transformative Role of PCK: The different models of PCK purported here by different researchers suggest that PCK is an amalgamation or blend of different knowledge bases that are different but integrated in order to attain a wholesome teaching-learning experience. This is the integrated view of PCK (Nillson,2008). One of the criticisms of this conceptualization is that the integration of different components might still not give rise to a holistic model for understanding and could possibly lead to many imbalances in teaching where focus on content could predominate pedagogy or vice versa. Transformation' of knowledge is another conceptualization which is akin to a compound in chemistry, where the various constituents form a given compound but the parts cannot be identified separately as they are so deeply ingrained that it's almost impossible to filter out each component. Such kind of teaching offers a seamless blend of teaching strategies so as to give rise to innovative planning and some of the best teaching practices related to a specific topic. However, some of the problems encountered by many critics have been that it refers to a cook-book kind of recipe that tends to fit in any situation and with anyone applying the already proven strategy to achieve the expected learning outcomes (Newsome and Lederman, 1999). Thus, teachers' individuality and creativity are not considered.

Too many Categories and Diffused meaning of PCK: The current view of pedagogical content knowledge tends to move beyond the listings of the categories and segregation of teachers' knowledge into sub-components, rather takes a more contextualized view of the whole issue of teachers' knowledge base, by taking into consideration certain covert aspects such as cognitive processes behind teachers' decision making about a particular pedagogy, teachers' own experiences as a student and as a student teacher, culture of the classroom as well as teachers' own, etc. Some times in the wake of including so many categories of knowledge in one term called 'PCK' makes it highly diffuse and the concept tends to lose sight of its topic-specificity with which Shulman had started (Van Dijk, 2009). In order to

retain its topic specific character, the core elements of PCK need to be analyzed.

PCK and its Role in Transforming Teaching and Teacher Education-a review of Literature

PCK is not only a theoretical construct rather a practical and reflective component of teachers' knowledge. It has its implications mainly concerned with the practice component of teacher education programme rather than theory. Breaking down the term PCK gives rise to different sub-components such as pedagogical knowledge, subject matter knowledge, and knowledge about the context, curriculum, and assessment strategies. These components have already been identified and reinforced in various curricular documents. Some of the thrust areas that the documents (Curriculum Framework for Teacher Education, 2004) on teacher education envisage include preparing teachers to integrate indigenous knowledge in the theory and practice of modern educational thought; empowering them to evolve culture-specific pedagogy for the learners; capacity building in utilization of new findings of research, community experience and institution-based and field-based experiences; developing an integrated and holistic approach in the teaching of social sciences and science and technology; and empowering teachers to inculcate values among learners embedded in different subjects. There has been a special emphasis on the role of classroom pedagogy in bringing about an educational change in the National Curriculum Framework (NCF)-2005. The educational change that the document envisages includes a central focus on democracy, issues related to human rights, caste, religion and gender by adopting a 'critical pedagogy' approach. Critical pedagogy facilitates collective decision-making by encouraging and recognizing multiple views and opinions of all the participant students belonging to different sects of society, such that their voices are not neglected or suppressed rather contribute in the process of knowledge construction (pp. 23, NCF-2005). Although these areas specified in these documents are not directly related to PCK but contribute to it in some way or the other.

The present NCF document stresses the need for curriculum renewal for teacher education by stating that the present teacher education programme is insufficient for creating better equipped and reflective professionals. According to it, the teachers lack the necessary expertise to develop linkages between school and society and are reluctant to conduct educational experiments. The in capacitance of teacher education

programmes is clearly reflected in the following lines in the document.

"Most teacher education programmes provide little scope for student-teachers to reflect on their experiences and thus fail to empower teachers as agents of change."

Thus, keeping in view the above arguments made in some of the national documents, a need is felt toward renewing the curriculum for teacher education for which PCK provides a ray of hope. In the west, however the construct PCK has contributed to many researches in the area of teacher education. The following are some studies that provide evidence for the emancipatory role played by PCK in teacher education.

In-service and Pre-service secondary science teachers

In-service upper secondary chemistry teachers

Major Findings

Active construction of Co- Res and PAP-ERS helps in the better understanding of teachers' PCK as well as enhances student learning.

Calls for an articulation of years of professional practice as PCK of the experienced teachers so as the novices can gain from it as well as apply it in their own teaching-learning by recognizing and adapting it with the present cultural and environmental context.

PCK is a construct that is known to have a direct influence over teaching efficacy and student learning, therefore has an integral role to play in educational sphere, both in content and practice.

PCK of experienced teachers can inform and improve upon prospective teachers' practices of teaching-learning and a programme has been designed in this regard called as ERTE (Educational Reconstruction for Teacher Education).

A developmental model of PCK came up as a result of in-service workshop sessions with the in-service teachers during which discussions and deliberations were carried out, that lead to teachers' in- depth understanding of the concepts as well as learning about students' difficulties and misconceptions and overall lead toward the enhancement of teachers' PCK. Also, implications have been provided for teacher

Conducted a review of studies related to PCK as well as different models and attributes of PCK added and researched by various educationists and curriculum developers in order to come up with a broader understanding of the concept. A hierarchy was thus developed encompassing different terminologies used for PCK till now in the

recent researches such as generic PCK, domain-specific PCK, topic-specific PCK, etc. that led to generation of taxonomy of PCK. Such an approach of categorizing PCK and developing a separate taxonomy serve as a basis for laying down the foundation of development of PCK amongst pre-service teachers in various teacher education programmes and thus help a great deal in the professional development of teachers.

The above-mentioned studies are specifically related to teachers' professional development as well as teaching efficacy via PCK. All these studies highlight the exhorting role that PCK can play in the development of an expert teacher. The studies also provide a rationale for the incorporation of this component of PCK in pre-service teacher education curriculum as well as in-service training programmes as PCK is not declarative form of knowledge rather a propositional and reflective form that cannot be developed just by introducing this component at pre-service level rather the teachers need to be constantly engaged and equipped with this form of knowledge by means of intervention programmes taking care of different attributes and categories within PCK, of which knowledge about students' ways of understanding and misconceptions as well as culture-specific and context-specific pedagogical strategies are most important. Thus, calling for a life-long learning programme for teacher development and learning.

The system of education and education as a whole has undergone a massive change in recent years. This can be attributed to a whole lot of factors such as changing socio-political milieu, changing educational policies, changing curriculum, changing patterns of assessment and evaluation, public-private partnership in educational sector, and globalisation and its impact in changing the face of education.

All these factors play an important role in shaping our classroom education knowingly or unknowingly. But are our teachers, who happen to be the major stakeholders and transmitters of this educational change aware or serious about it and if yes then what are their pedagogical approaches in the classrooms to cater to such a change. In the literature review section, we have seen how PCK impacts and enhances the teaching efficacy of teachers, therefore our contention in this paper is can PCK in any way guide the teachers in sailing through this change more so in corroborating this change within their classroom teaching. In the light of this vision, we carried out a study in order to understand the role of teachers' knowledge in

bringing about pedagogical transformation with respect to changing educational scenario.

The Study Design

In order to cater to the present objectives of this study the researcher undertook a survey design method wherein a questionnaire was constructed in order to gauge the perceptions of our teachers about the prevailing educational change, their respective roles in dealing with it as well as the need to adopt it and integrate it in their teaching. The questionnaire was pilot tested and then distributed to 43 teachers having 0-13 years of experience and enrolled in a masters' degree programme in education (M. Ed). The responses gathered from the questionnaires were then content analyzed based on the pre-determined themes for our present study which were as follows:

1. Perception of teachers about teaching as a challenging profession
2. Role of the teacher in this changing state of affairs
3. Status of present Teacher Education Programme (TEP)
4. Sharing experience of an effective pedagogy complying with the changing educational world
5. Impact of context on Pedagogy
6. Impact of any one global or educational change on classroom teaching

Insights from the field study-RESULTS

The responses that were gathered from the teachers using the questionnaire that had six major themes can be arranged as follows. Perception of Teachers about Teaching as a Challenging Profession.

Most of the teachers find teaching as a challenging profession in terms of catering to the different needs of different individuals, inclusion, curriculum load on the teachers as well as students, upcoming policies in education that change the shape and pace of education every now and then. Adapting their teaching to varied pedagogy and altering the same depending upon the topic at hand was also seen as challenging due to the burden of non-teaching tasks that the teachers are endowed with resulting in lesser and lesser time for worthwhile teaching. Diversity in the classroom and adapting to newer technology used in teaching-learning are some other challenges attached to the teaching profession.

Role of the Teacher in this Changing State of Affairs Teachers have always been treated as passive beings in school as they do not have a say in some of the major decisions related to their own teaching and education in general, for example,

curriculum to be followed, textbook to be referred, pedagogy to be adopted in the classroom, etc. But, on the other hand it is the responsibility of the teacher to make the learners aware about the changing world and equipping them in this regard. Some of the arguments given by the teachers in this regard were, educating the learners about conservation of resources, taking examples from day-to-day life for making learning context specific. Teachers are perceived as facilitators in the learning process rather than a mere translator of knowledge due to the increase in awareness level of learners which makes it important to share students' views and opinions.

Status of Present Teacher Education Programme (TEP) Most of the teachers hold the opinion that the present teacher education programmes have a negligible share in enabling them foresee and adapt to the changing education demand of the world.

The present TEPs are more focused on pedagogy and have a narrow subject specific approach rather than viewing things by keeping them in a backdrop of themes and issues such as globalization, public- private partnerships, socio-political conundrums, and economy and state policies. However, another group of teachers are in favor of saying that the present TEP have taken some very good initiatives such as by including latest researches, sensitizing the learners toward learning differences amongst students, gender schooling, curriculum development, etc. The rest of them feel that the present TEP need to be revised and revitalized in the light of the present educational demands of the country, for which technology should be made an important component of TEP.

Sharing Experience of an Effective Pedagogy Complying with the Changing Educational World.

Here some of the teachers shared their classroom experiences as a learner or as a teacher wherein the pedagogy adopted was clearly linked to the changing world circumstances or aided in understanding them better. Some examples include teaching the concept of 'Banking' by planning a field study to a local nearby bank where the students can learn about the processes and transactions going on in the bank; certain human values have also been a focus of classroom learning such as 'responsible citizenry' that was taught by taking the students to an orphanage where they donated their old books and clothes; conservation of water as a resource has been a major issue of concern these days due to depleting water table, this was raised in one of the classroom by telling a

story to students, whose major theme was conservation of water. A set of three unconventional responses gathered from the teachers wherein they have devised an innovative pedagogy to deal with the changing world demands, such as:

1. A play on "Bishop's Candlesticks" to teach students the qualities of a good human being: here the teacher noticed the change that the world is facing today in terms of commercialization and materialistic bent of mind resulting in an attitude of instant gratification. Thus, the teacher writes, "while teaching language my focus will be on choosing such topics to discuss that enable children to be sensitive and develop qualities of patience, for instance, the play, "Bishop's Candlesticks", I would discuss the qualities of the Bishop and encourage students to like him- generous, caring, pious, and compassionate. I would elaborate upon the fact that the way Bishop changed the convict's nature, ideology by being good to him and accepting him with his faults, each one of us can achieve the same and by developing these qualities. In the play students will see two contrasting characters-the Bishop and the Convict. The Bishop's character redeemed the convict and that is what students will be asked to emulate in their own lives too."

2. Safety for Women: these days the issue has taken a furor and needs to be discussed and debated for the rights and security of women. Hence, the teacher writes, "while teaching this in the classroom, I need to analyze and discuss the ways women are biased against, be at home or at workplace. Being a woman, they are facing discrimination in day-to-day life. Group discussions and newspaper clippings and sharing own experiences can be organized before coming to the ways to resolve the issue." 3. Changing weather patterns and pollution: the change perceived by the teacher in this case pertains to the environmental change due to the evolution of gases in the atmosphere which are harmful and cause disequilibrium in the nature. The pedagogical approach that the teacher devises for dealing with such a change and explains it, "When in the class while discussing oxidation or combustion of different materials, I make sure that learners know what will be the effects of such reactions. I try making them use minimum reagents and have also asked my school authorities not to use CCl_4 , as it causes harm to the humans if inhaled and to the nature if evaporated or heated in large quantity. Thus, my pedagogy has become more sensitive and cautious towards the use and misuse of chemistry in daily life."

Thus, the responses gathered under the above-mentioned theme indicate to some extent that only few teachers were able to diagnose some of the worldly changes, such as declining morals and values with respect to citizenship and as a good human being, depleting natural resources such as water and changing weather and environmental pattern such as global warming and increasing pollution. The pedagogical intervention devised by the teachers to deal with these changes also seems to be appropriate and innovative too. But, there is a greater need to understand some of the broader educational changes such as technology and its impact on education, impact of globalization and public-private partnerships in education, incorporation of latest researches in science and technology, dealing with inclusion in the classrooms and making education learner- friendly with the help of study modules that adapt to the changing needs of the learners to name a few. Thus, there emerges a need to orient our teachers in this direction and to broaden their horizon so as to make them think beyond their subject-specific boundaries.

Impact of Context on Pedagogy

There could be many factors that impinge upon the pedagogy to be adopted in the classroom. Some of them were enumerated by the teachers as school infrastructure, classroom culture and environment, govt. education policies, coaching classes, internet, changing schemes of evaluation such as CCE (Continuous Comprehensive Evaluation). Most of the teachers felt so much overburdened with the administrative tasks being given to them that they seldom had time and energy left to think about the pedagogy. This clearly depicts that pedagogy is being sidelined in most of the classrooms. But some of them do feel that pedagogy should consider the context such as the urban or rural setup and cite examples accordingly. Technology seemed to be one of the most overwhelming factors that have the ability to transform classroom teaching-learning and as noted by the teachers' aids in framing effective pedagogy.

Example of Impact of Any one Global or Educational Change on Classroom Teaching

Here some of the anecdotes from teachers' responses can be quoted as follows.

1. "Inclusion in education system for catering to the needs of especially able children. Teachers should design such activities that do not hurt the differently abled learners psychologically or socially."

2. "No Detention Policy impacts the education system adversely by deteriorating the quality of education. This can be handled by teachers in ways that learning is of interest to the students and is for the sake of learning and not attainment of grades or marks." 3. "Inclusion has its impact on both teaching and learning. Teachers need to be aware about the various learning difficulties and help the learners in overcoming them by providing them extra time, individual attention, care and designing some special tasks for these learners so as to hone their skills, and make them feel comfortable. Here the parents can also be involved and their support can be sought."

4. "The adoption of some of the new policies such as 'No Detention Policy' and CCE has made the learners adhere to a laid-back attitude toward their studies, they do not want to do their efforts and work hard. This is leading to an increasing disinterest amongst the learners. This 'educational change' can be handled only by way of interesting pedagogy whereby the learner develops a joy for learning, which can be done by using AV aids, projectors, educational movies and documentaries."

5. "Use of technology in education which can be integrated within the teaching of each and every subject, for example, in English teaching different skills can be taught and mastered such as writing, listening, grammar, pronunciation, meaning-making, etc."

The anecdotes gathered from teachers' responses appear somewhat more like a suggestion and less of an action. It seems that teachers are aware of the different policies and schemes adopted by their schools but do not find themselves in the partaking role, as a result of which they are able to empathize with the plight of differently abled learners but feel the handicap of dealing with this change head-on. Similarly, with the 'No Detention' scheme the teachers share their grievances and dissatisfaction and are able to devise suitable strategies to curb the laid-back attitude of some learners but only few were able to devise suitable pedagogical measures to face such a contextual change.

III. DISCUSSION

The present study provides evidences for the significance of Pedagogical Content Knowledge in the area of educational change, its impact and fallout on classroom pedagogy. The teachers were able to identify some of the educational changes such as those related to changing milieu of socio-political changes like changing values, materialistic bent of mind, declining safety for women, environmental changes

such as global warming and depletion of natural resources and biodiversity, changing governmental policies including 'No detention policy', 'Inclusive Education', etc., but only few were able to devise suitable pedagogy for overcoming and adapting to the change. But, as it appears the teachers have a limited repertoire of knowledge of linking their teaching to some of the broader educational changes and changing world that will include issues such as working towards scientific literacy, humanistic education, bracing oneself with the latest technology and devising learning modules for students, educating the young to contribute to a social cause, and an integrated approach towards education. The data suggests that only some teachers have an effective pedagogical expertise to integrate the changing educational trends within the teaching of their respective subjects and have been cited in their pedagogical anecdotes.

Such a mixed response from the teachers' side indicates that such issues are not being raised usually in any of the teacher education programmes that they have gone through as the one unanimous response that we gathered was that "TEPS only guide partially in equipping the teachers to deal with any kind of educational change." Therefore, the reason behind some of the teachers being able to perceive any educational change and integrating the same in their class-room teaching can be attributed to their personal teaching efficacy and perception with respect to educational change.

Thus, the reflection is on the present-day teacher education programmes running in our country that fail to equip our teachers in this regard as almost all the teachers in our sample have pointed out. But, the question arises as to where to include this component; this has to come both at the theory as well as practical level. This can be done by including it within the teaching of a particular subject that is to say at the level of Pedagogical Content knowledge only then can this educational change will be transacted effectively in the classroom. Hence, re-establishing the importance of PCK in bringing about change and innovation in teaching-learning. PCK can also be used as a means to understand teachers' knowledge in any of these areas and incorporated and extrapolated to similar situations. Since context impacts PCK therefore, the different correlates of context have a direct bearing upon the PCK adopted by a teacher in a classroom which need to be further researched upon. Since PCK is said to have a transformative role on teaching as well as teacher education, therefore its need cannot be re-emphasized in the present teacher education programme. The following flowchart will help in

understanding the course and structure of this change.

IV. CONCLUSION

The objective of writing the present paper is emphasizing the importance of Pedagogical Content Knowledge (PCK) in guiding teachers through the process of educational change that the world has faced in the present century and transacting the same by way of their classroom teaching. However, the present study is just a beginning step to understand the conceptions our teachers hold about the changing educational scenario, and to our surprise we have discovered that not many teachers are aware about these educational changes and have been confined to their subject related boundaries only. This has generated an even greater concern foreducating the prospective teachers about these educational changes that the world has been going through for which PCK can act as a means to achieve a higher aim of adapting young teachers face such challenges. PCK as a construct is now a well-known concept in the sphere of professional development of teachers in equipping them toward effective teaching as the literature also provides evidence. So, why can't PCK act as a road map to facilitate and adapt both the teachers and the learners for any kind of worldly change. For this to become a reality, many more researches focusing upon the PCK of different teachers dealing with such educational changes in their classroom have to be gauged, and for which we need to have such teachers. Thus, the seed has to be sown at the most initial level of teacher education programme. The following are some of the Educational Implications that have been derived from the present study.

1. Teachers to be made aware about the global changes that the world as a whole is facing and boiling them down at the level of education.
2. Teacher education programmes (TEPs) need to be situated within the broader framework of the educational changes specifically related to a particular country.
3. TEPS should provide a link between imagery and real, often the teachers when moving out from a TEP are not able to perceive or handle the educational demands of the learners, school and society. This leads to tensions in the minds of both the teacher and administrator.
4. PCK as a component should be integrated within the TEP and especially in the context of tackling the educational changes.
5. TEPS need to have a relook at the curriculum that they propose and should strive toward including this component of

educational change and the factors contributing for it within them.

V. SUGGESTIONS FOR FURTHER RESEARCH

The present study is just an initiation toward the cause of educational change via teacher education route, but many more studies are required to gain an in-depth understanding in this area. The following are some suggestions for future researches within this area.

Understanding educational change in different contexts and its reflection in classroom processes. Studying the impact of PCK in developing effective strategies for dealing with educational changes.

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