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एन सी ई आर टी
NCERT

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NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

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Original manuscripts of the articles must be sent in English, typed in Times New Roman - 12pt., double space, on one side of A-4 paper with sufficient margins, to

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An abstract of the paper in not more than 150 words must be sent with each manuscript.

Diagram or line drawings must be supplied separately, numbered neatly for identification and their position in the text clearly indicated. Tables may be given as part of the text.

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CONTENTS

Editor's Note

The shift in the role of teachers articulated through the National Curriculum Framework–2005 and the rapid technological developments have created challenging tasks for the teachers, as well as, teacher-educators. How far our teachers are able to facilitate learners to construct knowledge by providing them a fear-free and challenging atmosphere, addressing diversity and inclusion, connecting knowledge outside school life, and infusing technology effectively in the teaching-learning process are critical and crucial to ensure quality education. The articles and research papers in the current issue of *Journal of Indian Education* discuss some of these concerns and are endowed with some practical solutions for the improvement of our education system.

Preparing quality teachers and providing continuous support to them at various stages is a prerequisite to address the challenges for ensuring quality education. The paper by Alex M. George and Ram Murti Sharma explores the concept of an ideal teacher based on the field experience as a student-teacher. Using narratives, teacher biographies, analysis of research studies, the authors highlight the stagnation in the pre-service teacher education programme. The importance of continuous capacity development programmes of teachers has been recognised as a crucial aspect for better quality output in all levels of education. D. Thammi Raju, P. Ramesh, G.R.K. Murthy and S. Senthil Vinayagam conducted an empirical study on newly recruited faculty members of different agricultural universities to explore the perceived knowledge and relevance of teaching competencies and to identify their training needs. The study recommends the importance of periodic competency need assessment for organisation of capacity-building programmes.

A deep understanding of any language occurs when a learner is able to use the language in all forms of expressions. The paper by Devika explores the problems faced by rural students in using second language for oral communication and expression and proposes some exercises where students can work on improving their oral presentation skills. Dhanya Krishnan stresses the relevance of conceptual understanding in learning physics. The author suggests the need of integrating pedagogical design in the teaching-learning process so that alternative conceptions could be redirected to conceptual changes. The paper by Mary Vineetha Thomas and R.G. Kothari emphasises on how cooperative learning can be used in elementary leadership and decision-making skills through learning science subjects. Madhu Gupta and Dimple Mehtani reveal the importance of self-regulated learning in the academic achievements of students.

An empirical study by Hema Ramachandran, Divya Sinha and Medha S. Rajadhyaksha addresses the concept of plagiarism and large-scale plagiarism among undergraduate and postgraduate students. The study reveals that most of the students are not aware about the issue of plagiarism and instead believe that these are permitted 'soft crime'. The paper suggests a few approaches to encourage original writings and avoid plagiarism.

Many efforts have been made by the government to ensure universal access to elementary and secondary education in India. The paper by Alka Shah and Sonali Hazra studies the status of school participation among tribal children of Sonebhadra district of Uttar Pradesh through secondary data. The paper explores various reasons for variation of school participation among tribal children from different blocks of the district.

Integrating technology with the classroom teaching-learning process can be considered as a big challenge in our educational system, especially at school level. Vibha Devpura has made an attempt to investigate the effectiveness of smart class on achievement of science subjects at the upper primary level and found that students performed better with integrating technology. An analysis of using podcasts as a medium to blend teaching through technology has been done by Russell D'Souza. The involvement of community in the functioning of school has become a crucial topic of discussion since the National Curriculum Framework–2005. How community members, parents and family members can support academically in various activities of a preschool has been highlighted by Kalpana Venugopal. This issue of *JIE* ends with a review of NCERT published book *Schooling, Socialisation and Identity—A Textbook for B.Ed. Course* by Ranjana Bhatia.

We expect that our readers would be able to relate their personal experiences with the issues and concerns discussed by the authors of these articles and research papers presented in the current issue. We invite our readers from different levels of school education and teacher education to contribute in the journal by sharing their knowledge in the form of articles, action research reports, theoretical papers, book reviews, etc. Your suggestions and comments for improvement of the quality of the journal are welcome.

Academic Editor

Life, Ideals and Learning(s) to be a 'Teacher' in B.Ed.

Interactions, Observations and Learning†

ALEX M. GEORGE* AND RAM MURTI SHARMA**

Abstract

The central concern of the paper is an analysis of the definitions and images of an ideal teacher that one gains while being trained in B.Ed. programmes in India. The study explores this theme with the help of numerous student-teacher interactions, interactions with faculty members as well as the textbooks and other study material through which the author traverses. These interactions between student-teachers and teacher educators look into their experiences in the classroom, hostel life, teaching practice and assignments. These aspects have been contextualised and woven along with the broader experiences and exposure that the author gained while working in the field of education prior to the programme and the disjuncture that has come to permeate the ideals in teacher education programme. The paper uses these narratives to critique the teacher education programme as well as to highlight its stagnation. The data for this study emerged through detailed documentation while the author was a student, as well as through further discussions after the completion of the programme. It also looks at a series of studies that emerge from teacher biographies, teacher educators' research, analysis and studies on teacher education programmes, along with a few discussions on the definitions of an ideal teacher.

INTRODUCTION

This paper draws from a variety of experiences that the second author (Ram Murti Sharma) had during the course as well as through his interactions with the fellow student-

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teachers and teacher educators. A variety of aspects about the teacher's role get communicated through these interactions. Teacher educators are largely responsible for defining and emphasising the role a teacher is expected to play, not merely in classroom transactions but also beyond the classroom in their daily lives and practices. Similarly, student-teachers interact and collectively share their notions about teachers, school and the child outside classroom. As studies indicate, the creation of a definition of teacher emerges from such beliefs of teachers. Morine-Dershimer and Corrigan (1997, p. 299) have pointed out the following.

- Beliefs about teaching are formed during early school experiences, long before students enter the teacher-preparation programmes.
- Beliefs are deeply personal, and have strong emotional component.
- Beliefs serve as a filter or screen, influencing teachers' interpretation of events, and they may distort information processing.
- The longer a belief is held, the more difficult it is to change.
- Beliefs about teaching are initially formed from the perspective of pupil, and thus fail to account for the full complexity of classroom interactions.
- Constellations of beliefs form a belief system, with some beliefs being more central than others. Educational beliefs are connected to other beliefs in the system.

Thus, teacher education programmes play a significant role in either sustaining or rupturing these belief systems. This section of the paper attempts to observe the same in teaching-learning programmes by incorporating author's reflections on discussions, and interactions with fellow student-teachers and teacher educators. We have divided this article into two broad themes: interactions that took place in classrooms or outside, and instances that are unique in teacher education and distinguish them from a graduate programme.

On Becoming a 'Student-teacher'

Ram was not an ideal student-teacher because he entered student life at an age when he had already crossed the age boundary of 'youth'. Having worked on various issues related to education, he was unlike most other student-teachers. However, B.Ed. was his first formal training in the field of education. In the view of college administration, he was a bad student who had not 'secured' sufficient attendance. On one occasion, during a discussion with a teacher educator about his experience of working with SCERT and NCERT at Eklavya and developing textbooks, the teacher educator advised him — "It is better that you remain silent about your work experience with the other teacher educators for two reasons: most of them would not understand the significance of such a role, and those who do understand will consider you to be a threat to them. Hence, you

will neither gain nor lose!" Thus, the author did not necessarily challenge the beliefs of the teacher educators. However, his fellow student-teacher probably saw him in a different light.

Becoming a student-teacher was not easy for the author as most classmates considered him as an 'elder', especially as he expressed criticism when 'obscene' comments about women and sexuality were made in the college and hostel premises. From then onwards, they avoided making such comments in front of him. Yet, student life in the hostels thrived on this big issue other than serious discussions, which were either political or academic. It is equally important to notice that, occasionally, teacher educators stay 'silent' on issues they are ambivalent about. One such occasion was on the issue of adolescent sexuality. Even though the teacher education programme for secondary school teaching is expected to address adolescents, the teacher educators meekly ask the student-teachers to read those sections on their own from guidebooks. This raises an important question — why do teacher educators lack confidence and feel 'ashamed of discussing certain ideas'. Thus, the teacher educator treats student-teacher 'as kids' just as his fellow student-teacher treated the author as an 'elder'. Following this incident, for the next few weeks, sexuality became a topic of discussion in men's hostel. The issue was trivialised often to the level of misinterpretation and as a source of entertainment. Throughout the programme, there was no occasion where women were treated with dignity. To a large extent, this indicates how neither the teacher educators nor student-teachers are trained to consider certain issues seriously and trivialise them without any sensitivity.

What 'new' did you learn from B.Ed.?

Occasionally, Ram attempted discussions with student-teachers about the new things they had learned in B.Ed. college as compared to their previous degree experiences. Often, they identified a few topics or skills and specified: "we learnt to control children"; "we know how to make a presentation"; "how to interact with children", etc. But they also often wondered if this knowledge would be useful once they move to real classrooms. Student-teachers found nothing wrong with the things that were taught. For example, they would say "it is necessary to control children", that it is the only way to "deal with children". Student-teachers were never exposed to any alternative perspectives or radical pedagogies or de-schooling thoughts. Ram felt that his classmates during graduation and post-graduation around 15 years ago 'were more articulate', 'had more political views', 'were more exposed', were 'willing to explore and look for new content', as compared to his fellow student-teachers. Teacher education programme did not seem

to promote such ideas either, and sometimes directed them against it.

Similarly, views about teacher educators were equally ambivalent among the student-teachers. Their preference of a teacher educator was primarily because s/he interacted leniently, and not on the basis of their academic abilities. But if the teacher educator reproduced the textbook during the session, it was considered a 'boring thing to do'. If the teacher educator reproduced some unknown information, s/he was considered a better teacher educator—for example, during a discussion on Human Development Index (HDI), if the teacher educator mentions that according to the recent reports, India's position moved from 125 to 127 or 'in corruption, India is ranked higher than previous year'. Anything that is considered complex is unacceptable. On one occasion, there was shouting of slogans in the hostel — 'Piaget hai hai'; 'Piaget hai hai' in the late evening. This was in response to the day's lecture where they were introduced to Piaget's stages of development. It was communicated by the teacher educator that this was a complex concept in itself. Indirectly, the teacher educator was trying to communicate that this was 'one of the theories that you need not study. If you leave this out, not much harm would happen to the examination'. When we compare this with the manner in which 'information' is appreciated by student-teachers, such as on Human Development Index (HDI), we notice that there is a faith that aim of education is to acquire information and this is in concurrence with the ideals from guide-textbook. This probably also explains why the paradigm of behaviourism that seem to be 'easily' understood gets perpetuated in teacher educator[1].

Why were author's fellow students unable to question and think differently? Part of the reason could be in the 'newness' that student-teachers feel when being exposed to new domains like psychology with the teacher-educator and textbooks being the authority. Partly, this could be a continuation from the ways in which student-teachers have experienced their classroom processes as students in school. Any student who contradicts or questions the teacher is seen as a threat, and thus student-teachers remain unthreatening. In this sense, Ram as an individual could be argued out to be 'unique' and irrelevant in creating a critique of teacher education programme. Yet, it is true that teacher education fails to create ruptures in student thinking.

[1] In an altogether different context, a teacher educator of DIET in Uttarakhand posed the question "You are introducing theories like that of Vygotsky for BTC (Basic Training Certificate) students, how do you expect them to understand them? We learned these theories in our M.Ed., should we not just stick to Thorndike-Pavlov-Skinner, after all, these are just for teaching primary school children, and others are higher level, abstract theories".

There are no Role Models

Ram was sure that, unlike school or college, none of the faculty in B.Ed. College could become role models for him and there was no emotional or academic attachment to any faculty in the institution. The depth of their academic knowledge or rigour in classrooms was shallow; they often refrained themselves from entering into serious discussions within the classroom. When teacher educators use textbooks like 'Walia', student-teachers find it difficult to respect them. Unfortunately, books like those by Walia (2004) too do not inspire and guide well. However, ironically, these very books idealise the teachers as role models.

Some teacher educators often based their classroom lectures on rote-learning of passages from Walia! Notes that were dictated in class were also from Walia! Teacher educator would advise the student-teachers that "you can reproduce my notes for your examination to get good marks". Moreover, on one occasion a teacher educator gave an assignment to a student-teacher to write down the names of the headings and sub-headings of all the topics she had taught in the previous five months in class—the student-teachers did this by copying from the content page of Walia's guidebook. Teacher educator raised no objection to this and accepted the material. Thus, we see that this continuous merging of expectations of the teacher educator and student-teachers can have a debilitating effect on the entire education system.

We are a Professional Course

From day one, teacher educators repeat, "You are going to be a teacher, unlike your graduate degree days. B.Ed. College is not a 'free' space; you should not make 'noise' like when you were school children or graduate students. You should act like a teacher. Start behaving like a teacher. You should not create a mess in the campus. You should not break rules and regulations of the school. Act responsibly."

In the above context, the notion of profession is simplified. It gives us a glimpse of a dominant perception among teacher educators about school as a space to discipline and control children. On the other hand, teacher educators use this definition of the teacher to control the student-teachers themselves. One may partially blame the guidebooks that have become central to the teaching-learning process in teacher education. Here, the definition of teaching profession becomes a means to 'control' the student-teacher not for the purpose of professional skill development, knowledge or attitudes but merely in a behavioural/character-building fashion. Teacher educators themselves probably have not imbibed or accepted themselves as professionals in true academic sense, hence transferring such notions to the future teachers. In this context, we can argue that this manner of defining the teacher

is disempowering for the student-teachers. One example of this was author's adventures with organising a protest about which we shall read later.

The absence of the notion of a professional community is also reflected in the discussions on primary school teacher. "Primary school teaching is very easy. You do not need 'much' input for children at this level. The 'complexity' of material (textbooks and concepts) that need to be taught is simpler." This comparison is used by the teacher educator to 'inspire' student-teachers to feel superior to their fellow professionals. It is necessary to notice that this attitude has other implications and is perilous. In our misconceived education system, the primary school teacher is someone trained by those who have an M.Ed. degree. The qualification required to join M.Ed. is B.Ed., whereas to become a teacher at the primary school, the qualification is D.Ed. D.Ed. degree holders thus have teacher educators, who have done B.Ed. and come with a baggage that is antagonistic to a primary teacher.

Attempts to Mobilise

Students from different colleges in this university used to come to Ram's campus to talk over tea. Since the students felt that a lengthy paper for examination would be a disadvantage for their career prospects in comparison to other universities[2], everyone agreed to organise meetings at their respective colleges. Ram was asked to lead the process in his college due to his experience in student activism, even though he remained silent during the initial discussions. As the first step, he advised them to write to the University Vice-Chancellor, and ask the Principal for a recommendation. However, the Principal refused to make any such recommendation, since rules were 'already laid out and could not be amended in the middle of the year'. It was decided that strike is the only way out—and everyone agreed that all colleges needed to participate.

Ram asked the teacher educator if she could allow some discussion time in his batch. The teacher educator allowed them on the condition that they do not 'disturb other classes' and 'have a silent meeting'. Ram agreed and told the teacher educator that if she wishes, she too could stay in the classroom. Teacher educator remained in the classroom. Ram explained the practical problems with the pattern of examination and the disadvantages he and his classmates were likely to face in future. Everyone agreed that students who studied in colleges affiliated to this university have serious disadvantage. It was

[2] Maybe we could have talked about the farce of objective questions themselves or evaluation methods used in our higher education, but it is beyond the scope of the current paper. We briefly pointed out textbooks like that of Walia that are designed to suit the purpose of examination, where students are evaluated by the number of pages they write or the number of points they mention in their answers.

decided that a formal meeting would be held during recess time. Everyone in the classroom agreed to join the meeting.

However, the teacher educator began to explain the disadvantages of organising a strike — the college could deduct their marks for following such practices; why strike is a bad practice; why rules cannot be changed; how college can rusticate those who participate and take initiative, etc. Student-teachers silently listened and the result was visible during the recess. Out of 300 students, merely 10 to 15 came to the meeting — none of the student-teachers with whom Ram had initiated the discussion and who had promised to mobilise in their own batches turned up.

On other occasions, Ram observed that most student-teachers believed that it was discipline that had made them better learners in school days. They would often argue that discipline had eroded and needed to be re-established. This perspective partly helps us understand why the above incident happened. Another important observation about this incident was that students were given the 'permission' to involve in a classroom discussion on the condition that they would not disturb the neighbouring classes. When the teacher educator began talking, the discussion turned into regular classroom scenario where the knowledgeable teacher 'informs the student' of the dangers going against the norms. Thus, even though teacher educators talk about discussion method in school classroom, they seem to perceive that discussions and activities seemingly break the discipline. School and college classrooms are expected to be spaces where students remain silent rather than active.[3]

In a broader social context, this event reveals the belief and expectations of teacher educator—standing for one's rights is wrong. It reflects the manner in which power relations are conveyed to the future teacher. It informs that they are weak and disempowered in the education system and cannot change the existing system and structures. In the real world schooling system, they are expected to be obedient. *Thus, subversively, notion of teacher as an agent of change is pushed under the carpet in the favour of obedience.*

Developing Teachers as Strict Disciplinarians

Teacher educators often pointed out that teachers ought to live a disciplined life—punctuality; obeying the authority; doing their duty, etc. As a teacher, it is essential to discipline the children—in 'model classrooms', children are expected not to ask questions—if at all anything needs to be asked, it should be questions

[3] It may be noted in the margins. Joshi (2008) observes similar popular perception among the middle school teachers about the Hoshangabad Science Teaching Programme (HSTP), where activity/ discussion was central to the learning of science teaching.

on content from the textbook. During teaching practices, student-teachers are told that 'you should ask question' and not the students. An ideal teacher is the one who can keep the students quiet in the class. Students should respond only to what is being asked by the teacher. During practice sessions, some student-teachers went to the extent of threatening the students to remain silent. Teacher educators often suggest that 'it is okay' to beat students if they talk or disturb the class.

According to the teacher educator, discipline is important because 'you can teach smoothly' and questions and free interactions from students divert attention. Essentially,discipline is needed for conducting classes in a 'practical manner and completing the syllabus and meeting the other demands from authorities on time'. These ideas largely echo views expressed in guide-textbooks as well as prevailing popular notions about schooling.

Influencing the Teacher through Sweet-talk

In the teacher training programmes, pleasing the teacher educator is considered an essential 'duty' of the student-teacher. Many student-teachers believe that it is important for their 'success' and are 'proud' to engage in such activities. They think that they would score higher marks by influencing the teacher educator. Universities have a regulation that no teacher educator can give a score of more than 85 per cent or less than 20 per cent to any student. Many student-teachers feel that influencing the teacher educator reduces the 'burden of teaching practice sessions' since teacher educator sometimes allows them to skip a few sessions. Teaching practice sessions are evaluated and scored by the teacher educator. Thus, universities belittle the autonomy and trust in the teacher educators on the one side and on the other side, at least a few student-teachers believe that they have scored a higher grade and feel proud of being crafty.

Interestingly, a friendly student-teacher and teacher educator's relation is not seen in a positive light, but is repeatedly viewed as exploitative, or patronising. This probably stems from the experiences of student-teachers as well as ways in which teacher educators decide to place them within the education system. This, however, is important as we assume that such relations get perpetuated further when student-teacher finally reaches his/her school. Patronising cannot happen without the knowledge of hierarchy. Each teacher educator and student-teacher knows the amount of 'influence' teacher educator has on the college Principal. This is reflected when student-teachers approach any one of the teacher educators with a particular demand. It is also likely that sometimes the teacher educators ask their student-teachers to approach another teacher educator who has a 'closer relation' with the Principal. Hence, in the larger scenario of schooling system, student-teachers

are 'informally' trained to function in relation with the officialdom of educational bureaucracy. Probably, a large part of the failure of education system is this failure to see any possible positive aspects in student-teachers and teacher educator relationship.

This clearly is an instance of how and where the ideas of power come from and how it functions within the institutional structures. The network of power relations in college probably is an extension of what and how the society itself organises. A teacher educator is regulated by the university system that determines education/examination pattern—the keen awareness that student-teachers would depend upon and draw from guidebooks and not necessarily from the manner in which teacher-educator (if) wishes to transform the practices discourages innovation. It is important for the teacher educators to sustain and keep the Principal and college administration in good humour just as they probably wish to patronise and have control over the student-teachers.

Doing Things in Real and Ideal

The uniqueness of teacher education programme is the ways in which student-teachers re-learn school classroom practices. We identify and discuss them below. Strangely enough, across the programme, the theoretical courses and real teaching are evaluated separately. As a nation that celebrates 'rote learning', it would be interesting to observe the 'do it' sessions. While this makes the course different from other graduate programmes, it also makes it at par with professional programmes, where students of medicine, law, etc., start their practice.

The Role of Teaching Aids

In the initial days of the programme, teacher educators talk about preparation of teaching aids, but over the next few months, they disclose that student-teachers need to make teaching aids only during the teaching practice session and final (teaching) examination, which is conducted in the presence of an external observer. They also tell that in real schools, teachers are not expected to use these teaching aids. Some teacher educators go to the extent of asserting that such tools are 'really not useful/essential' for children to learn. We can also see the lowering emphasis on teaching aids since many student-teachers avoid preparing them during the academic year and simply want to complete their course. In such situations, teacher educators encourage the student-teachers to visit the nearby shop where readymade teaching aids can be purchased. Very often, such shops are situated close to the B.Ed. colleges.

Authors also came across a 'tool' called 'pointer' which was radio aerial fixed to an umbrella handle and was available for 50 rupees! As per the textbooks, this 'tool' is to be used by teacher while giving lectures—to

pinpoint a specific area in a diagram, or a place in the map, or part of a body in chart, or an item in a periodic table, etc. It is clear that such tools emerge from the idea that students sit facing the teacher in a classroom and observe the teacher's action and never explore anything on their own. But most often, the products that are sold are thermocol models of tools given in the textbooks. The teacher educator expects the student-teachers to make something from the lists given in the books and make no efforts to teach how to make them. Sometimes, student-teachers recycle the tools available from previous year's submissions. Thus, teaching tools stand to represent some artefact that needs to be made and stored in the higher education institutions rather than being used in school classrooms. In fact, most teacher educators themselves do not use teaching aids to teach the student-teachers.

All this, however, would never be accepted in certain scenarios, for instance, when NAAC (National Assessment and Accreditation Council) team was expected to visit the college. Prior to the visit of such evaluation bodies/teams, teacher educators would visit every class and request the student-teachers to answer questions asked by people from the NAAC team in a positive light. They are expected to say things like classroom practice usually happen through discussions; that there are regular symposium and seminars; that teaching aids are used, etc. Hence, the system of rote-learning and teacher centredness not only refuses to create/use teaching aids, but also indirectly supports those who are against teaching aids.

In the first few months of teacher education, no assignments are given to the students. However, towards the end of the programme pressure starts building up. Students often quote lack of time as an excuse to justify the 'purchase' of models for their presentations. Everyone feels safe having completed the formalities. However, the prime concern is not just the buying of readymade models but that of the underlying lack of faith in using teaching aids and models. This seems to confirm the observations of researcher Britzman (2003). He points out the categories of real and ideal notions about teaching practices and how they sustain. While talking about the teacher educators, Britzman discusses the various ways in which they interact with student-teachers. "...Others will try to be affected by the newly arrived, take them in the confidantes of their secrets, or even try to warn them of the emotional risks to avoid. They will counsel them to just finish student teaching. And they will promise that after student teaching is over, they can become real teachers." (p. 8). In the Indian context, teacher educators are largely aware of the absence of use of activities and teaching aids in school classroom. Hence, they make no attempt to change these practices of school classrooms through teacher education programmes.

In our opinion, there is no emphasis on the need for teaching aids because the knowledge of a subject is seen as information (as we read the case of social sciences). Teaching aids merely substitute a visual spectacle that could replace the voice of the teacher. Hence, thermocol models and pointers are easily accepted. This chasm highlights the failure of an education system to recognise the nature of subjects (like social science not merely as information or textbook-centred) and the need for subject pedagogic knowledge in a classroom. Hence, doing a survey to understand the economic life becomes a wastage of time while teaching economics as the teacher educator does not attempt to create a linkage between pedagogy and nature of the subject. Teacher training programmes focus only on what student-teachers are going to do in the real world — where the only tools that may be used beyond chalk and duster would be thermocol models and pointers. Teacher education prepares the student-teachers to comply and repeat what they have observed as school children rather than develop their unique teaching style.

Teaching Practice and Lesson-plan Notebooks

In the entire teacher education process, which lasted for 10 months, student-teachers enter school 'classroom like' situation only twice. The first time they do so is for 'teaching practice' and the other for 'microteaching'. These are 'classroom like' situation because student-teachers are aware that they are not 'real' classrooms. They are merely reports to be drafted and submitted for evaluation. For each area of specialisation, students submit 21 days of lesson-plan under teaching practice and 5 under micro-teaching.

Microteaching

This is a mock classroom scenario that a student-teacher enters. The fellow student-teachers sit in these mock classes — few student-teachers are expected to act like students— and one student-teacher conducts the classes. Teacher educator sits in the class as an observer and a few student-teachers may also assist the teacher educator. Within a classroom, multiple groups carry out micro-teaching practice. Microteaching is meant for practice of teaching skills. Teacher educator often points out the skills that could be attempted while doing microteaching, teacher educator demonstrates how to do the session. One of the skills that is expected to develop the 'skill for introducing the topic'. Teacher educator often dictates the kind of questions student-teachers could use in this situation. It is emphasised that these questions need to be very simple and direct, the expected answer should be short sentences or yes/no. Questions should be concrete and without abstraction but giving factual answers. For example, if a student

wants to practice microteaching on a chapter on Constitution, the class would begin as follows—student-teacher would ask, 'When did India achieve freedom?', 'What happened on 15 August 1947?', or 'Did we celebrate Republic Day this year?', etc. But Ram observed that such questions never lead to the topic of Constitution itself. By then, the time limit for such sessions is over, and at the end, the student-teacher is supposed to have learned the 'skill for introducing the topic![4]

Textbook description of micro-teaching highlights it as a unique contribution of India to the teacher education programmes. Per se, microteaching probably does not provide opportunity to evolve the skill of question-making and hurriedly reproduce the textbookish models of questions. It limits the open-endedness in responses and the questions are expected to 'hit the target'. It considers teacher as having complete control over the knowledge that will emerge in the process. Microteaching is expected to follow observation schedules that are available in textbooks. Any deviation from the observation schedule is considered a failure. However, many student-teachers fail to create the prescribed textbook scenario. So, they seek an apology when they fail to 'hit the target' and withdraw. Yet, everyone would make sure that recordbooks are submitted with details of what they did in the microteaching session, 'after all you tried doing it'.

We also found that skills were different from the method itself. Even if ideas like microteaching were significant for student-teachers, given the type of questions and methodologies adopted, these do not seem to be effective. In order to teach any discipline, irrespective of its nature, student-teachers are expected to have skills that can be separated and practised independently, by repeating them in front of a class of imaginary children. Thus, we feel that certain activities in education programmes are created for the sake of making them look like activities — microteaching is probably one of them.

Lesson-plan Notebooks

Another element in the current practice of teacher education is lesson-plan notebooks which claim their lineage from German philosopher and educationist Johann Herbart who lived until 1841. When writing lesson-plan notes, student-teachers just focus on completing the task for the sake of formality. Microteaching

[4] There are many samples cited in Walia guide-textbooks from B.K. Passi. However, student-teachers sometimes create their own dialogue, for instance:

Q. Where do you live? **A.** India.
Q. In which continent is it? **A.** Asia.
Q. What is the neighbouring continent? **A.** Europe.
Q. Name another continent near Asia? **A.** Africa.
Q. Now which is the smallest continent — hold on, you don't know this — I will tell you — It is Australia!

is done in October–November and teaching practice only towards the end of programme where student-teachers are expected to demonstrate all the different skills of teaching. Often, teacher educators advise the student-teachers to copy from someone else's 'teaching practice copy' for the final submission. Logistically, teacher educator might have a problem giving a detailed feedback. But student-teachers sometimes share that teacher educators harass them by not signing their notebooks. Either way, student-teachers know the 'fake nature' of this classroom since as children they never experienced such situations in school.[5]

There are certain ideas that continue to survive till date. One among them is that 'all lesson-plan notebooks submitted for evaluation need to look uniform, neat, organised'. It is expected that lab reports of all science graduates should look similar. On the other hand, they are expected to follow the structured content of a Ph.D. thesis such as: introduction, hypothesis, literature reviews, statement of problems and so on. The entire education system discourages any other creative ways of expression and representation of knowledge other than the written form.

Every student-teacher submits lesson-plan notebooks that have been bought from the same shop/ printer with the same structure and design. This practice reflects a dominant practice in the education system: 'errors cannot be permitted' and 'uniformity' is valuable than 'uniqueness or creative independence' because equality in the scale of evaluation of students is possible only if every student submits their report in the same manner, and have accepted same indicators. These aspects thus seem to move in recurring fashion, and have been built into the education system.

Assignments, Seminars and Presentations

The author feels that assignments and presentations become redundant because of the absence of continuous input and supervision by the teacher educator. Ram who is an avid cricket fan found it amusing that errors in his write-up on a young cricketer from Gujarat went unnoticed by the teacher educator. As part of a paper on physical education he collected information from all possible sources regarding this cricketer. When he felt the 'length was insufficient, (he) used wild imagination' and provided wrong information. One among the most

[5] Krishna Kumar (2007) points out numerous problems with lesson-plans becoming a ritual and suggests, "[t]here is a need to conceptualize teacher preparation for the classroom in an altogether different design or mode of functioning. Such an alternative design will have to do away with the idea of a fixed number of lessons and supervision of a certain proportion of them" (p. 98). Sinha (2000) provides a detailed analysis of lesson-plans and possible alternatives to this deep-rooted practice in teacher education.

spurious practices in such write-ups are 'quotations'. With some flair and flavour, a series of observations that were attributed to senior former cricketers from around the world, were added about the young player, and finally prepared into a 15-page write-up. There were numerous 'new records' invented and endorsed in the youngster's name. In his entire life in educational institutions, this was the biggest goof up done by the author. His friend also copied the same passages. Similar incidents happen while doing 'Tests in psychology' (There were three tests: general mental ability test, personality test and aptitude test of people from different age groups). They were provided with inventories and tools developed by different psychologist. The tests are essentially expected to help student-teachers to learn how to calculate scores, how to read the table, how to read the indicators, etc. He had prepared his own copy but then someone else submitted another copy in his name! The fact that teacher educator pays little attention and no feedback is given to the student-teachers often hampers the purpose of such activities.

Gardening is a component under the Work Experience programme. The syllabus says that students are expected to have 'hands on experience' in one area. As we pointed out earlier, this sub-section focuses on experiences of student-teachers in the context of 'to do' in contrast to learning through 'lecture'. However, in practice, the course title seems to be misguiding since Ram learned gardening without dirtying his hands! The only occasion when Ram touched the soil was to do some cleaning in the B.Ed. college garden for the visit by NAAC team. Student-teachers maintain scrapbooks with seeds, roots and leaves; gardener demonstrates preparation of soil, identifies the tools, etc. Most often, the paper is taught by a Botany lecturer. The curriculum covers knowledge of the kind of plants or trees that are 'useful' for garden; their botanical names; information about manure; kitchen gardening; soil and so on. The student-teachers never plant a seed, or water or manure them. The supposed purpose of this course is for gardening with school children but not necessary for B.Ed. students. This clearly shows the meaning of valuable knowledge for B.Ed. College as opposed to knowledge for school children. We noticed a continuity and reiteration of the firm belief among teacher educators and probably in the entire education system that all knowledge can be transacted through lecture. While the botany lecturer provides a list of ideal plants for garden, thankfully there is a gardener to demonstrate the process of planting. The fact that a gardener's knowledge is accepted in the system is certainly a positive aspect but also conveys the message that teachers only talk about knowledge as facts and not its implementation. Moreover, the evaluation is done on

the basis of the scrapbook, which only indicates that knowledge is legitimate only if it is codified and transferred into written words and bound spaces. Just like in the context of lesson-plans, only written word is considered as trustworthy in this system of evaluation. Imagine if all B.Ed. colleges actually planted trees, probably in spite of all its archaic practices, we would have found all those buildings in the middle of thick forests!

In the context of social science teaching, activity or discussion method, etc., are also done through lecture method. There is never an attempt to organise classrooms for demonstration or practice teaching. Teacher educator simply read out passages or dictates notes in the class. Thus, what happens in 'do it' sessions of B.Ed. programmes is just a continuation of what students experience in their school classroom. Britzman makes certain key observations that clearly explain this scenario.

"We have all played a role opposite teachers for a large part of our school lives. It is taken for granted that we all know what a teacher is and does. This knowledge is based upon years of observation. It must be remembered that by the time a person enters teacher education, she or he has spent approximately thirteen thousand hours observing teachers. Observation skills acquired through schooling allow students to 'survive' in classrooms: students not only learn to interact with formal curriculum of teaching and learning, but act as well within a hidden curriculum. In fact, those who are more 'successful' actively read the text of the teacher – her or his moods, behaviours, values, judgement, discourse strategies, and classroom expectations." (Britzman, 1986, p. 28).

Through Ram's critical narrative of his interactions with teacher educators and student-teachers as well as exploration in narratives of classroom practices and do-it sessions, we get a perspective on the continuous and stagnated education practices. The rupture that he had imbibed while being in spaces that were alternative to the mainstream views about teacher having no space in teacher education. Yet academic and policy discourses have repeatedly cried out for the need of breaking away from rote-learning. Teacher education that ought to have become a space and opportunity to create such ruptures from/with what children observe in school classroom are alienating to Ram's already ruptured experiences.

Learnings and Definition of a Teacher in the Programme

The question that is central to this research is—What image of the teacher emerges in the programme? How does this image get perpetuated both within the guide-textbooks as well as the practices of teacher educators? For teacher educators and fellow students, there are no

alternative models but for the ones they are already familiar with, yet the system refuses to acknowledge the need for a reform in the existing schooling practices. In contrast, Ram's work in the field of education prior to B.Ed. focused on moving away from rote-learning. We observed that these textbooks bring in elements from all the perspectives on the role of a teacher, and disown them. These books draw from various policies, thinkers and popular notions about teacher, effectively leaving the student-teachers with no specific models or paradigms to identify with. Student-teachers are left to assume that teachers and textbooks are the most important sources of knowledge, and that controlling the students in classroom, disciplining them and in turn becoming disciplined themselves is their central role. The programme denies them an opportunity to reflect upon their own experience of schooling or contextualise their in-built notions about teachers.

Ram had engaged in larger debates about the child's ways of learning and teacher's role prior to B.Ed. These debates were often outside the sphere of teacher education institutions and universities. The state intervention through school programmes [like DPEP (District Primary Education Programme), SSA (Sarva Shiksha Abhiyan), Lok Jumbish] or activities of NGOs who were involved in such debates engaged mostly with elementary schools and teachers. Teacher education institutions and universities continue with programmes that are academically un-engaging. A partial explanation could be drawn from how higher education has come to stagnate with limited exposure of the teacher educator and use of textbooks by authors like Walia (2004). However, Alan R. Tom (1997) argues: 'Teacher education program redesign must be an ongoing process of deconstruction and reconstruction, of rethinking and re-creating design in teacher-education needs to be responsive and emergent due to the evolving nature of disagreements over the ends of education (and therefore of teacher education). Unless teacher educators continually renew their programmes through collective reconsideration of current practice, their programmes gradually become inflexible and ultimately become disconnected from educational and social institutions, as well as detached from prospective teachers.' (pp. 70–71). This does not seem to happen in B.Ed. programmes. Tom (1997) also observed that within the university system, teacher educators are 'oppressed' and have to 'carry larger teaching loads' (p. 195). Thus, the lacuna could be identified only if one explores the multiple regulatory bodies that have interest in teacher education programmes like UGC (University Grants Commission), NAAC, NCTE (National Council for Teacher Education) as well as parallel expectations from school regulating bodies like State Boards and NCERT. Apart from the above-mentioned

contradictions, the state policies have been further discouraging to the teacher education system, especially so in the last two decades through claims like 'increasing access of schools for children', or 'providing jobs for educated unemployed', or 'appointing untrained personal'. Yet, for someone who had been engaged with school education system, it was surprising that often even the teacher educator did not follow the 'popular discussions—say articles in newspapers and magazines which engaged with ideas about learning and teachers, their engagements were surrounded and built upon textbook notions that brought in stagnation.

Earlier biographic research has drawn our attention to the fact that most people teach the way they have been taught. Gary Knowles (1992) says, "…understanding the origins of student-teacher perspective is largely a product of understanding the impact of biography—those experiences that have directly influenced an individual's thinking about teaching and schools (p. 102)." Within this context, Ram's discomfort with the process of B.Ed. programme emerges from his own biography, the grounding and exposure he received in various social science subject domains over ten years. As an outsider to the university system, Ram has been continuously exposed to alternative ways of thinking/observing teachers in NGOs, yet such reflections are seemingly unnecessary to university programmes. This stagnation of perspective becomes visible through Walia's ways of defining social science as equated with information which further feeds into the definition of a teacher. Education system itself has failed to observe the changes within social sciences. Hence, the absence of interaction of the social scientists (or for that matter any subject) *vis-à-vis* the education departments and brings in stagnation in defining the role of a teacher in relation to subjects.

As pointed out earlier, there is no real difference in the list of qualities identified for a teacher because s/he specialises within a subject domain. On the contrary, the same qualities are identified across subjects. How and why does this happen? Part of the reason could be the overdependence of education on ideas like Bloom's taxonomy, and not specificities of nature of various subjects. It is assumed that every subject domain—Music, Mathematics, Social Sciences—can have the same nature and can be taught and measured in the same manner. This belief in defining every subject as having certain fixed taxonomy leads to the assumption that what teachers need to do is pick up any theory of learning like behaviourism or constructivism and fix it into some set of methods of teaching, some set of scales of evaluation, and resources to be used in classroom. Thus, any understanding of the ways of learning becomes appropriated when fit into the existing list of rituals for student-teachers. A teacher in such teacher education programmes is defined as someone who can evade or negotiate

through such paradigms. In contrast to this, the social science programme of Eklavya, with which the author is familiar, did not use such magic taxonomy solutions in guiding the learning process but emphasised on social science skills and abilities (*kaushal*). Moreover, it was strongly beyond the understanding/definition of social science as merely information recall (Eklavya, 2012).

Exam orientation remains at the heart of the programme. The classroom processes are neither designed in such a way that they enable the student-teachers to understand/engage/critically think about school classrooms nor visualise their role as teachers with clarity. The available opportunities, which move beyond lectures that have been built into the programme, are easily turned over as ritualistic requirements. In the entire programme, there were many aspects where student-teachers were told not to engage with, or their boundaries were marked and pointed at, for instance: shying away from talking about adolescent sexuality, discussions on theoretical areas like in the context of Piaget or Constitutional provisions on the side where content transaction may be crucial. On the other side, through various practices of interaction between student-teachers and teacher educators, it restricts student-teachers from engaging with the manner in which B.Ed. students would be evaluated, direct them to remain apolitical and unorganised as a community of teachers, or even distance themselves from fellow professionals like primary school teacher. In the textbookish definitions, all teachers are expected to have subsumed their individual abilities and have acquired collective (often misguided) qualities. Further, teacher education programme gives no opportunity to the student-teachers to reflect upon their own images of teachers or guide them to move away from dominant practices of teacher-centred classrooms, with strong interaction and centrality to the children. Hence, the definition of teacher that student-teachers carry home at the end of this disconnect is an ideal, official version.

Student-teachers are instructed on how to write the exams; how to get hold of models during practical teaching exam; how to negotiate with teacher educators to score better marks; how to reduce the 'burden' of real practice, etc. It is often argued that Benjamin Bloom has become the most dominant perspective in Indian teacher education, and most teachers have come to trust behaviouristic theories alone. It is interesting to observe that this was one of the topics that every teacher educator avoided teaching during Ram's training! At the end of the course, while the two authors were 're-reading' the textbooks, Ram was surprised to know that there were chapters in the guide-textbooks that were dedicated

to Bloom's Taxonomy[6]. Ram too had filled in lesson-plan notebooks and created questions without hearing about Bloom. For reasons good or bad, what comes to notice is that anything that the teacher educator feels student-teachers would not understand or the teacher educator him/her had not understood is left out. This is guided by an exam-oriented motive and student-teachers are advised, "You must attempt the alternative questions in your examination." Thus there is no particular psychological theory (or for that matter any education theory) in which student-teachers are trained because examination provides an opportunity to become a professional without any such perspective. Or, as we have seen from textbook analysis, every theory is described and criticised as 'time consuming', 'not relevant to the Indian context', etc. The evaluation of examinations is expected to be based on a number of points written down by the students. Hence, irrespective of what you think about any theory or apply and think through them, what makes a professional is the ability to reproduce a large number of points for or against a theory. In this cultural understanding, learning is defined as getting the sheet of certificate. It makes you eligible to enter classrooms without knowing or understanding the world of children, school or knowledge and become a teacher.

If one considers the cultural myth pervading the notion of a teacher, the teacher-education programmes and schooling experiences of student-teachers seem to substantiate and sustain it. Breaking new paths beyond the textbook and teacher-driven/ centred classroom remain illusionary in B.Ed. programmes. Hence, certain practices become rituals, the traditional assumptions about classroom practices repeatedly re-enacted in teacher education classrooms. Even though the syllabus and curriculum include themes like 'different methods of teaching', they are never reflected in the practices of teacher educators, and hence, they re-enforce or neutralise any effort to change. In that broader sense, attempts to define the 'quality' either through changed syllabus cannot resolve the glaring problems in higher education system.

Finally, if we assume that Indian school system needs to change, we first need to visualise teacher education as being able to create a 'rupture'. Ram's learning from his previous job experience, in curriculum, classroom observations and subject expertise leads him to reflect upon the teacher education he underwent. However, since other student-teachers or teacher educators do not have such exposure, they often fail to appreciate any criticism that may emerge from his point of view. Rupture in images of the teacher or defining their role is possible if only teacher education is designed to provide more opportunities for being reflective.

[6] An engaging critic that analyses problems of taxonomy in teacher education programmes of the USA (Moore, 1982).

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† Notes of the author, Ram, running over 1,500 pages in Braille; microteaching and lesson-plan notebooks, etc., have been used as primary sources for this study.

Teaching Competencies of Newly Recruited Faculty of Agricultural Universities

An Analysis†

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Abstract

This paper explores perceived knowledge and relevance of teaching competencies and determined teaching needs of newly recruited agricultural university faculty. The aim is to develop the content for initiating capacity-building programmes. Previously developed instrument with modifications is used to determine 20 teaching competencies by examining 204 newly recruited faculties of 19 Agricultural Universities representing Agricultural Sciences, Veterinary Science, Home Science, Horticulture, Fishery Science, Sericulture, Engineering, etc. Mean weighted discrepancy scores calculated to determine the teaching needs. The greatest teaching needs identified were 'getting students engaged in learning', 'undergraduate advising', 'teaching in practical settings', 'using web-based technologies for managing courses' and 'effective teaching fundamentals'. Certain teaching competencies viz. 'learning styles of students and faculty', 'distance education basics' and 'undergraduate advising' significantly varied among newly recruited faculty (teachers and scientists). 'Active learning strategies' across Universities and 'learning styles of students and faculty', 'teaching in practical settings' and 'better teaching through better testing' significantly varied among faculties of agriculture. Gender has no influence on any of the teaching competencies. The identified and prioritised teaching competencies provide the content and direction for development of capacity development programmes for the newly recruited faculty. It suggests periodic Competency Need Assessment (CNA) of faculty at all levels — young, mid-career and senior — and develop programmes for quality agricultural education.

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Introduction

Quality education in Agriculture stems from the teaching competency of the faculty which is the core driver, apart from the other factors of enabling environment *viz.* institutional environment, guiding philosophy, value of institutional commitment, effective quality initiatives, assessment processes, mechanisms and practices of dissemination. Teaching staff need competencies to innovate and adapt; this includes having critical, evidence-based attitudes, enabling them to respond to students' outcomes, new evidences from inside and outside the classroom and professional dialogues, in order to adapt their own practices (European Commission Report, 2013).

Measuring teaching quality is also challenging, which is influenced by the method of recruitment, experience in the field and career development with a clearly defined advancement, etc. Duta, Panisoara and Panisoara (2014) emphasised that the teaching profession requires a prior initial training, not only in terms of the formation of specialised professional and psycho-pedagogical competencies but also in relation to the awareness of particular responsibilities involved by youth training, while vocational guidance has to come in line with one's own professional development needs, with a set of skills designed properly for teaching profession. The agricultural graduates are required to possess professional capabilities to deal with the concerns of sustainable development (productive, profitable and stable) of agriculture in all its aspects. Agriculture education should address the stakeholders' expectations especially for utilitarian mode. Quality and relevance of higher agricultural education is the need of hour to facilitate and undertake human capacity-building for developing self-motivated professionals and entrepreneurs. Contextual understandingof teaching competencies in terms of cognitive domain, skills, attitude–values helps in designing better capacity-building programmes Also, high academic performance of the faculty does not ensure the pedagogical skills of the faculty. The present study was postulated with the following objectives.

Objectives

- To identify the knowledge and relevance levels of selected competencies of newly recruited faculty in Agricultural Universities (AUs).
- To compare knowledge and relevance levels of selected teaching competencies to determine teaching needs of AUs' faculty.
- To find out differences among faculty in teaching competencies.

Background of Agricultural Education in India

The Indian Council of Agricultural Research (ICAR) coordinates, guides and manages research, education and extension services in agriculture, including crops, horticulture,

agroforestry, fisheries and animal sciences. The major objective of ICAR is to plan, undertake, aid, promote and coordinate education, research and its application. Planning, development, coordination and quality assurance in higher agricultural education in the country is taken care of by the ICAR. It strives for maintaining and upgrading quality and relevance of higher agricultural education through partnership and efforts of ICAR–Agricultural Universities (AUs) System comprising State Agricultural Universities (SAUs), Deemed to be Universities (DUs), Central Agricultural University (CAU) and Central Universities (CUs) with Agriculture faculty. Veterinary Council of India (VCI) regulates veterinary practice including Veterinary Education through State Agricultural Universities/Veterinary Universities, which are established through the Legislative Act of the respective State with major financial support from them leading to administrative and policy controls. The ICAR continues to provide professional and partial financial support to them for enhancing the quality, relevance and access of higher agricultural education. With about 265 constituent colleges having about 35,000 student intake capacity, the AUs impart education in 11 major disciplines at undergraduate and about 95 subjects at post-graduate level (NAEP Draft Document, 2012).

Competency of the Faculty

Recruitment of faculty in Agricultural Universities is through a national advertisement. Research accomplishments, academic excellence and interview performance are the criteria for selection of faculty. Qualification in National Eligibility Test (NET) in a specific discipline is a prerequisite. The institutional mechanism to develop and/or test teaching competency of the young faculty of Agricultural Education before recruitment is non-existent. Also teaching and learning support—pedagogy enhancement programmes and continuing education programmes provided for senior faculty is quite minimal.

Methodology

A descriptive design was used to analyse the teaching competencies of newly recruited faculty of Agricultural Universities. The newly recruited faculty of 19 Agricultural Universities *viz.* Acharya NG Ranga Agricultural University, Govind Ballabh Pant University of Agriculture and Technology, Indira Gandhi Krishi Vishwavidyalaya, Junagadh Agricultural University, Karnataka Veterinary, Animal and Fisheries Sciences University, Punjab Agricultural University, Professor Jayashankar Telangana State Agricultural University, Sri PV Narasimha Rao Telangana State University of Veterinary, Animal and Fisheries, Sardar Vallabhbhai Patel University of Agriculture and Technology, Sri

Venkateswara Veterinary University, Tamil Nadu Veterinary & Animal Sciences University, Tamil Nadu Fisheries University, Tamil Nadu Agricultural University, University of Agricultural and Horticultural Sciences, Shimoga, University of Agricultural Sciences, Bangalore, University of Agricultural Sciences, Dharwad, University of Agricultural Sciences, Raichur, Uttar Banga Krishi Vishwavidyalaya and University of Horticultural Sciences, Bagalkot were considered as sample. About 204 respondents represented Agricultural Sciences, Veterinary Science, Home Science, Horticulture, Fishery Science, Sericulture, Engineering and other branches. All these participants attended training programmes organised by the Academy during the last one and a half years.

Tools Used

The Borich (1980) model of needs assessment was used to measure participants' perception of 20 teaching competencies through a survey instrument developed for the purpose. Participants used a five-point scale (1 = low knowledge/ relevance; 5 = high knowledge/ relevance) to rate their current knowledge for each competency and the degree to which the competency was or wasn't relevant to their job. Earlier research studies supported the Borich Model to study the teaching competencies. This study had the limitation of self-reported levels of knowledge and relevance. The teaching competencies, i.e., 23 identified by Harder et al. (2009) were used. A pre-test was conducted among 40 newly recruited faculty and based on the response pattern, 20 competencies were finalised in the survey instrument. The data were collected through personal survey of respondents who attended orientation programmes for faculty of Agricultural Universities at ICAR—National Academy of Agricultural Research Management, Hyderabad from November 2014 to May 2015.

The sample composed of young Assistant Professors (engaged in teaching graduate, post-graduate and doctoral courses), Scientists (engaged in domain-specific research) and Subject Matter Specialists (engaged in extension activities and transfer of technology). Data were analysed using descriptive statistics and the ranking procedure described by Edwards and Briers (1999). A discrepancy score was obtained for each participant by subtracting perceived levels of knowledge from perceived level of relevance for a specific teaching competency. Each discrepancy score was multiplied by the mean relevance level of that competency, resulting in a weighted discrepancy score for each participant. The weighted discrepancy score was summed and divided by total number to arrive at Mean Weighted Discrepancy Score (MWDS) for each competency. Using this procedure, mean weighted discrepancy scores could range from 20 to –20. Positive scores indicate a need for professional development.

The mean weighted discrepancy scores for all the competencies were ranked to determine the priorities of faculty development needs of Agricultural Universities. Further, the data were subjected to ANOVA (Analysis of Variance) to identify significant factors influencing the teaching competencies.

Results and Discussion

The results of the first objective, i.e., identification of knowledge and relevance levels of selected competencies of newly recruited faculty of Agricultural Universities and the findings are presented in Table 1.

The faculty of the AUs were most knowledge able about 'Clarity in teaching' (M=4.172, SD=0.857), 'Effective teaching fundamentals' (M=4.010, SD=0.993), 'Teaching in practical settings' (M=4.044, SD=0.984), 'Creating the perfect course syllabus' (M=4.000, SD=1.032) and least knowledge able about 'Distance

Table 1
Competency Ratings: Perceived Levels of Knowledge and Relevance of AU Faculty

S. No.	Competency	Knowledge (n=204)		Relevance (n=204)	
		Mean (M)	Standard Deviation (SD)	Mean (M)	Standard Deviation (SD)
1.	Effective lecturing	3.995	0.878	4.078	1.039
2.	Clarity in teaching	4.172	0.857	4.152	1.061
3.	Teaching critical thinking	3.436	1.079	3.431	1.256
4.	Creating the perfect course syllabus	4.000	1.032	3.868	1.198
5.	Using student evaluations/ performance to improve teacing	3.946	0.979	4.015	1.034
6.	Using technology in teaching	3.922	1.043	3.975	1.107
7.	Questioning techniques	3.701	1.048	3.657	1.203
8.	Effective teaching fundamentals	4.010	0.993	4.108	1.059
9.	Peer evaluation	3.417	1.166	3.461	1.261
10.	Teaching & Learning styles	3.520	1.121	3.544	1.253
11.	Active learning strategies	3.755	1.182	3.848	1.279
12.	Getting students engaged in learning	3.877	1.027	4.108	1.144
13.	Teaching in practical settings	4.044	0.984	4.142	1.112
14.	Using web-based technologies for managing courses	3.353	1.176	3.471	1.213

15.	Better teaching through better testing (teacher evaluation)	3.632	1.010	3.672	1.125
16.	Cooperative learning	3.603	0.995	3.681	1.102
17.	Teaching large classes	3.294	1.146	3.137	1.208
18.	Distance education basics	2.627	1.153	2.559	1.183
19.	Undergraduate advising	3.735	1.1780	3.848	1.224
20.	Post Graduate advising	3.270	1.4249	3.255	1.480

education basics' (M=2.627, SD= 1.153). Well-structured, uniform curriculum and grading system as stipulated by the Indian Council of Agricultural Research (in case of Agriculture & other sciences) and Veterinary Council of India (in case of Veterinary Sciences) is followed uniformly in all universities so respondents were well-informed about the course content, course outlines, etc. The selected sample were either postgraduates or doctorates in their respective domain knowledge and were aware of importance of teaching in practical settings and fundamental aspects of teaching. Harder et al. (2009) also brought out that faculty of the College of Agricultural and Life Sciences (CALS), University of Florida, themselves had highest levels of knowledge of effective lecturing, clarity in teaching, graduate advising, teaching critical thinking and creating perfect course syllabus.

AU faculty perceived six competencies as highly relevant and the remaining competencies as moderately relevant. Highly relevant competencies were 'Clarity in teaching' (M=4.152, SD=1.0605), 'Teaching in practical settings' (M=4.142, SD=1.1112), 'Effective teaching fundamentals' (M=4.108, SD=1.059), 'Getting students engaged in learning' (M=4.108, SD=1.059), 'Effective lecturing' (M=4.078, SD=1.039) and 'Using student evaluations to improve teaching' (M=4.015, SD=1.034), and 'Distance education basics' (M=2.559, SD=1.183) was perceived to be the least relevant competency. Agricultural and Veterinary Education aims to prepare students for professional career and develop skills to meet the needs of farming community and hence the above competencies are most relevant for faculty. The most relevant competencies focus on fundamentals of teaching-learning, teaching methodologies and active students engaged in learning methodologies. AU faculty had low knowledge and relevance in 'Distance education' basics as very few faculties were involved in Distance education courses offered by limited AUs.

Mean weighted discrepancy scores (MWDS) were calculated for each of the competencies for the second objective. A positive MWDS indicates that training is needed, while a negative MWDS indicates that no training is necessary (Table 2). The range of possible MWDS scores was –20 to 20.

Positive MWDS scores were obtained for 13 teaching competencies and highest MWDS were for 'Getting students engaged in learning' (MWDS=0.894) followed by 'Undergraduate advising' (MWDS=0.422) and 'Teaching in practical settings' (MWDS = 0.396). The three competencies with negative MWDS were 'Creating the perfect course syllabus' (MWDS= –0.529), 'Teaching large classes' (MWDS = –0.516) and 'Distance education basics' (MWDS = 0.180). Harder et al. (2009) indicated that the competency 'Getting students engaged in learning' received highest priority in a study conducted among the faculty of College of Agriculture and Life Sciences at University of Florida.

Table 2
MWDS for Teaching Competencies of AU Faculty

S.No.	Competency	MWDS (n=204)	Rank
1.	Getting students engaged in learning	0.894	1
2.	Undergraduate advising	0.422	2
3.	Teaching in practical settings	0.396	3
4.	Using web-based technologies for managing courses	0.394	4
5.	Effective teaching fundamentals	0.393	5
6.	Active learning strategies	0.349	6
7.	Effective lecturing	0.333	7
8.	Cooperative learning	0.282	8
9.	Using student evaluations/performance to improve teaching	0.271	9
10.	Using technology in teaching	0.211	10
11.	Peer evaluation	0.151	11
12.	Better teaching through better testing (teacher evaluation)	0.142	12
13.	Teaching & Learning styles	0.086	13
14.	Teaching critical thinking	0.017	14
15.	Post Graduate advising	0.048	15
16.	Clarity in teaching	0.082	16
17.	Questioning techniques	0.163	17
18.	Distance education basics	0.180	18
19.	Teaching large classes	0.516	19
20.	Creating the perfect course syllabus	0.529	20

High credit load, e.g., 166 in Bachelor of Science (Agriculture) (4 years' duration), 177 in Bachelor of Veterinary Science and Animal Husbandry (5 years' duration), shortage of manpower and lack of knowledge about student-centered teaching methods were the primary reasons for following teacher-centric teaching methods, but realised the need for student-centric teaching methods and hence rated the competency 'Getting students engaged in learning' as highly relevant. Wardlow and Johnson (1999) also found that faculty considered themselves 'good to excellent' in traditional teaching methods such as lecture, demonstration, preparing teaching materials and motivating students.

Agricultural University faculty act as Student Advisors and mentor the students for academic excellence on campus and hence 'Undergraduate advising' was ranked high. About 39 per cent to 43 per cent of credit load in agriculture and allied courses are devoted to practical classes and hence respondents gave high rating to the competency of 'Teaching in practical settings'. Duta et al. (2014) characterised the university teachers on eight competencies *viz.* scientific competence, teaching competence, transversal competence, relational competence, vocational and dedication, experience in educational institutions, self-assessment and professional development and research. Romanian subjects ranked high on transversal competencies (e.g., capacity of information use, analysis and synthesis, interdisciplinary linking of knowledge, solving the problems arising in teaching room, teamwork, critical thinking) while subjects from Spain ranked high on teaching competencies (e.g., know-how to teach, have a solid pedagogical training, psycho-pedagogical skills, good communicator, interactive thinking, etc.). Zhu et al. (2013) indicated that teachers' educational competency, social competency and technological competency were positively related to their innovative teaching performance.

The third objective was to find out differences among faculty in teaching competencies. Significantly differing teaching competencies across the cadre/designation/position, universities, faculty and gender are presented in Table 3.

The teaching competencies *viz.* learning styles of students and faculty, distance education basics and undergraduate advising were significantly varying ($p \leq 0.01$) among the different cadres, i.e., Assistant Professors, Scientists and Subject Matters Specialists.

Active learning strategies across universities ($p \leq 0.05$) and learning styles of students & faculty, teaching in practical settings and better teaching through better testing were significantly ($p \leq 0.05$) varying among different faculties of agriculture. Newly recruited faculty have a trinity of functions *viz.* Teaching, Research and Extension as all Agricultural Universities were established following

Table 3
Differences between Competencies across Different Parameters

S. No.	Competency	Cadre (n=204)		Universities (n=204)		Faculty (n=204)		Gender (n=204)	
		F	Sig.	F	Sig.	F	Sig.	F	Sig.
1.	Effective lecturing	0.588	0.557	0.512	0.932	0.983	0.445	1.629	0.203
2.	Clarity in teaching	0.879	0.417	0.496	0.941	0.141	0.995	1.020	0.314
3.	Teaching critical thinking	0.905	0.406	0.554	0.906	0.461	0.862	2.923	0.089
4.	Creating the perfect course syllabus	0.041	0.960	1.211	0.266	1.338	0.234	0.938	0.334
5.	Using student evaluations/ performance to improve teaching	0.935	0.394	0.915	0.549	0.612	0.745	0.069	0.793
6.	Using technology in teaching	1.031	0.359	1.660	0.062	0.766	0.616	0.521	0.471
7.	Questioning techniques	1.750	0.176	0.701	0.782	1.139	0.340	1.353	0.246
8.	Effective teaching fundamentals	0.057	0.945	0.930	0.532	1.269	0.268	0.002	0.969
9.	Peer evaluation	0.173	0.841	1.151	0.314	1.130	0.346	1.232	0.268
10.	Teaching & Learning styles	4.571	0.011**	0.465	0.955	2.098	0.045*	0.483	0.488
11.	Active learning strategies	1.141	0.322	1.741	0.046*	1.483	0.175	1.731	0.190
12.	Getting students engaged in learning	0.581	0.561	0.940	0.521	0.991	0.439	0.390	0.533
13.	Teaching in practical settings	0.572	0.565	1.026	0.430	2.053	0.050*	0.232	0.630
14.	Using web-based technologies for managing courses	1.124	0.327	0.858	0.612	1.905	0.071	0.003	0.958
15.	Better teaching through better testing (teacher evaluation)	0.128	0.880	1.677	0.058	2.258	0.031*	2.012	0.158
16.	Cooperative learning	0.785	0.458	1.324	0.191	0.912	0.498	1.381	0.241
17.	Teaching large classes	0.358	0.699	1.617	0.072	1.593	0.139	0.243	0.623
18.	Distance education basics	4.915	0.008**	0.494	0.942	1.286	0.259	1.350	0.247
19.	Undergraduate advising	5.883	0.003**	0.637	0.842	1.931	0.067	0.015	0.903
20.	Post Graduate advising	0.968	0.381	0.860	0.610	0.983	0.445	1.629	0.203

*Notes: * Significant at 5% level*
*** Significant at 1% level*

Land Grant Pattern of USA and all faculty need to be equipped with relevant competencies to carry out these three functions. Empirical evidence suggested that most of the professional course students were Accommodators (Doer) as against Divergers (Watcher) and Assimilators (Thinkers) in academic course, and students' learning style and academic performance were significantly related (Tripathi and Sethi, 2014). The course content in Veterinary Sciences nurtures more 'Accommodators' than Agricultural Sciences. However, gender has no influence on any of the teaching competencies.

Nature of the course content, instructional designs, teaching and learning methodologies, duration of the course, complexity of the subject, etc., lead to the differences in the competencies of faculty. Varied academic excellence as reflected in teaching and learning styles was also observed among the faculty. The results point out that gender has no influence on the teaching competencies as all are exposed to the same content and methods as stipulated by either ICAR/VCI.

Conclusion

Getting students engaged in learning, undergraduate advising, teaching in practical settings, using web-based technologies for managing courses, effective teaching fundamentals, active learning strategies, effective lecturing, cooperative learning, using student evaluations/performance to improve teaching, using technology in teaching, peer evaluation, better teaching through better testing (teacher evaluation), teaching and learning styles, etc., were the core competencies required for newly recruited faculty of agricultural universities which should form the basis for content development in capacity-building programmes. Quality agricultural education reflect on the institutional quality teaching initiatives mainly targeting newly recruited faculty and part-time teachers and continuing education for senior faculty and support to teaching and learning environment by institutions produce quality graduates. Periodic competency need assessment (CNA) of faculty cutting across all levels—young, mid-career and senior faculty—with appropriate initiatives result in quality enhancement of agricultural education.

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A Study on the Acquisition of Paralinguistic Features of Oral Presentation Skills

Challenges to the Rural Students†

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Abstract

Acquisition of second language (L2) has always been challenging; the related theories and proposed ways to help students understand, grasp and use L2 for expression keep evolving. The present paper focuses on the problems faced by rural students while practicing oral presentation. The oral presentations of the rural students (Classes IX, X, XI and XII) enrolled in Pilani schools and nearby village schools were recorded and played for them to observe themselves. The students seemed to be keenly observant about the areas of improvement. Learners use a language better when they get to know the specific areas of problem and an explanation for each digression. Hence, the paper also focuses on how these errors, especially regarding paralinguistic features, are committed and how awareness can help these students polish their oral presentation skills.

INTRODUCTION

English, the undisputed language of the professional world, predominates in the field of education also. In China "English as a foreign language is a compulsory course in colleges and universities. Without passing the English exam, students cannot obtain their graduate diplomas or become post-graduate students" (Keqiang, 1986). The use of its communicative competence is varied and vast, encompassing sometimes even societal factors. "English is a foreign language in Tanzania, but but it comes with tremendous power and prestige" (Rugemalira, 2005). However, the acquisition of English as a second language (L2) is not without challenges. Effective command over

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speaking skills ensures sustenance and success; selection of proper words, exquisite placement of these words in the thought process, and immaculate and expected uttering of sounds help the rural students keep their confidence sanguine but only after overcoming these problems. The rural students in Pakistan also undergo the same trauma. "Students' speaking skills are at a pitiable state. Not to talk the weak students even bright students who get high scores in English written examination are unable to speak English language properly" (Bilal et al., 2013). Rural students despite being intelligent face a different kind of challenge.

Second language acquisition is very time consuming and it is more challenging for rural students; they start getting relegated in this race since the very beginning. Urban students seem to enjoy the lead and rural students seem to lag behind. "[U]nfortunately there is discrimination between urban and rural primary school students' English language learning. Students from urban areas show better proficiency in comparison with the students from rural areas" (Salahuddin, Khan and Tahman, 2013).

The essential boost to display the subject competence, linguistic competence and organisational competence is dependent on the extent of the command gained and groomed by umpteen practice sessions of oral presentation skills. No wonder, steps are being taken in this direction also. "Oral Presentation is one of the courses introduced to English majors in order to enhance their speaking abilities" (Al-Hebaish, 2012). Awareness leads to acquisition and practice leads to perfection but with proper self-analysis and expert feedback.

Rural students seem to be at a disadvantageous foothold (Kannan, 2009) probably due to improper teaching methodology, lack of facilities, lack of proper guidance at home, paucity of time, etc. When placed against the students who speak English fluently, rural students seem to be rough and raw in their speaking skills. Muhammad Younas (2013) in his study has found that even after learning English for about eleven years, especially rural area students are incompetent in language and unable to communicate the target language.

The process of seeking the understanding enables them to churn the thoughts to find a clue about one specific piece of information with very specific and concrete answer. Exposure and chance to share their opinion, raise their doubts, state their agreement, observe differences and suggest alterations work miraculously. Learning of simple basics is the first step. During the oral presentation, the attention is primarily caught by paralinguistic features. Little attention needs to be paid to their understanding which automatically leads to refinement in the speaking skills. The present paper focuses on the level of awareness and

acquisition of paralinguistic features; it also traces the level of challenges to be overcome by the students to reach the comfort zone.

Methodology

The research design of the study is descriptive in nature. The respondents of the study are the rural students, who study either in Pilani or nearby villages. The data comprises 9, 16, 16 and 11 students of Classes 9, 10, 11 and 12 respectively. The tool used for data collection for study is questionnaire. The questionnaire measures parameters like paralinguistic features of an oral presentation. The questionnaire is divided into two parts: the first part includes categorical questions in nature (yes or no) which seek information about the awareness of these rural students regarding paralinguistic features such as quality, volume, pitch, pace, pronunciation, articulation, modulation, pauses and vocalised pauses; the second part of the questionnaire includes questions based on five-point likert scale ranging from excellent to poor which tests their acquisition of these features while giving an oral presentation. The respondents were asked to give a presentation on the topic of their own choice. The presentation was recorded. The recorded version was shown in the presence of all students seeking feedback first from the presenter and then from the students. Students were given the feedback and requested/suggested to work on their weak areas. After a week, another recording was done and again shown to all the students. Again the feedback was collected for each presentation from all the students.

SPSS was used for data analysis using descriptive statistics. To analyse the data, frequency percentage was calculated for first part of the questionnaire to find out their awareness about the paralinguistic features. For the second part, mean was calculated to find out the level of the respondents' acquisition of the paralinguistic features. The reliability of the questionnaire was assessed and it was found to be α=0.976 which is under acceptable range.

Objectives

The objectives of the study are:

- to gauge the level of awareness of rural students' paralinguistic features; and
- to gauge the level of acquisition of rural students' paralinguistic features.

Results and Discussion

The study focuses on the dual aspects, i.e., awareness and acquisition of the paralinguistic features which exercise an indelible importance during speaking, an intrinsic part of daily communicative framework, be it social, personal or professional.

Quality

Quality, the permanent feature of voice, classified as deep, sonorous, squeaky, nasalised, etc., was known

to 55.55%, 87.50%, 93.75% and 100% students of Classes 9, 10, 11 and 12 respectively. However, when the recorded presentation was played, the level of acquisition was varied. Students were really surprised to note that the quality of voice did help them seek immediate attention. During the second recording session, those who had good voice quality tried to make use of it, while those who didn't have good voice quality tried to work on their pace of words, volume of voice and voice modulation to seek the attention of the audience. The mean value for parameter quality of voice is 2.46. Now, after the exposure the students feel that the level of difficulty has come down.

Volume

Volume, the loudness and softness of voice, was known to 66.66%, 93.75%, 100% and 100% students of Classes 9, 10, 11 and 12 respectively. When the recording was shown, students were surprised to note that volume can affect the content so drastically. The presentations with low volume gave the impression to the students that the students with low volume seemed nervous, unprepared, shy and even unwilling to speak, whereas the students with high volume seemed boisterous, rude and shouting for no reason. During the second recording session, the students tried to speak at a level that was perfectly audible to all students with no extra effort to be dominating. The mean value for the parameter volume of the voice is 2.44. The students seemed to be more confident and happy to know their own stand.

Pace

Pace is the use of words per minute; it might vary from 80 to 250 words per minute but in professional communication the acceptable range varies from 120 to 150. It was known to 22.22%, 81.25%, 93.75% and 100% students of Classes 9, 10, 11 and 12 respectively. While they observed themselves, they found that too fast as well as too slow the pace seemed extremely preposterous, even to the extent of amusement. Fast-paced speakers, with an air of affectation, seemed to wind up everything in a hurry, causing unintelligibility and great irritation to the onlookers. The second recorded session was marked by conscious and conscientious effort of the students to keep a check on their pace, though the original pace could not be drastically altered but the effort made was considerable. The mean value for the parameter pace of the voice is 2.58. The students learnt a lot after the recorded sessions but they still seemed to have some problem in overcoming the difficulty and regulating their pace.

Pitch

The highness and lowness of the voice known as pitch was known to 44.44%, 100%, 93.75% and 100% students of Classes 9, 10, 11 and 12 respectively. Its absence makes it more conspicuous; obviously "when

it comes to speaking English, it is no surprise to find that many students sound monotonous" (Binghadeer, 2008). While watching the first recorded session, students noticed that the inappropriate use of pitch changed the meaning of the stated information leading to different mistaken perception about the concept shared. They seemed happy to learn on their own that high pitch is used for anger, agitation, frustration, etc., whereas low pitch embraces calm, composed, relaxed, sad or dejected piece of information. The mean value for the parameter pitch of the voice is 1.12. The students found very few challenges to overcome for the acquisition of pitch.

Voice Modulation

The ability to vary and regulate pitch and volume, known as voice modulation, was known to 44.44%, 75.00%, 93.75% and 90.90% students of Classes 9, 10, 11 and 12 respectively. Too much use of voice modulation seemed artificial and concocted, whereas its absence marked dullness and monotony. Those students, who did not use voice modulation properly during the first recording, seemed pleased with the output of their second recording. Some even tried to use voice modulation to convert a statement into a question, a good and fruitful observation and implementation. The mean value for the parameter voice modulation is 2.71. The students had to first strengthen their awareness and acquisition of this parameter; hence the level of the challenges was highest for this parameter.

Pronunciation

To speak all the sounds according to the accepted norms, known as pronunciation, was known to 66.66%, 93.75%, 93.75% and 100% students of Classes 9, 10, 11 and 12 respectively. "English as a second/ foreign language need special attention paid to communicative skills in general and to pronunciation intelligibility in particular" (Morley, 1991). While watching the first recorded version, they became aware that they pronounced the same words in different ways which made them cross-check their pronunciation. Some of them were not even aware that they could not pronounce those words properly; some had the inkling that something was wrong but did not know what was wrong; some knew for sure that the pronunciation was not right but did not know how to rectify that. During the second recording, it became clear that they had come prepared after looking up for the proper pronunciation from audio dictionary and seemed to slow down to pronounce that word properly. The mean value for the parameter pronunciation is 1.10. The students had good awareness and good acquisition of pronunciation; and the challenges were the least.

Articulation

Articulation, the ability to speak all the sounds (accepted and prescribed) distinctly was known

to 55.55%, 93.75%, 93.75% and 100% students of Classes 9, 10, 11 and 12 respectively. During the first recording, the articulation was not at all in the mind, the mere knowledge did not seem to help much. After watching the recorded video, they realised their errors and found scope for improvement. During the second recorded session, every student seemed chary of not eating, slurring, chopping or truncating the sounds. The mean value for the parameter articulation is 1.12. The students had knowledge about the articulation; they had good grasp of it and the challenges to overcome were very less.

Pauses

Silence flanked by words is the pause. Natural and spontaneous pauses were known to 55.55%, 93.75%, 93.75% and 100% students of Classes 9, 10, 11 and 12 respectively. While watching the first recorded session, students found that a proper pause helped them convey the message with assertion. Absence of pause, caused by the desire to bring in fluency, only led to perplexing unintelligibility, whereas misplaced pauses led to distorted meanings, sometimes with hilarious outcome. During the recording of the second session, students seemed more comfortable and confident while using pauses, that too properly. The mean value for the pauses parameter is 1.15. Students had good awareness and good acquisition; and the challenges were not that great at all.

Vocalised Pauses

Vocalised pauses are the meaningless sounds made by speaker while giving oral presentation. The consciousness of not speaking for a longer period of time seemed to propel the students to make sounds or use stereotype expressions to fill the engulfing and threatening gap. Vocalised pauses were known to 33.33%, 87.50%, 81.25% and 81.81% students of Classes 9, 10, 11 and 12 respectively. During the first recording, students seemed to consider it an intrinsic part of their presentation. While watching the recorded session, students were really surprised and found it almost unbelievable that they kept using these vocalised pauses so frequently. They did agree that an elongated pause was much better than a vocalised pause. These vocalised pauses seemed to take away the very credibility of their point. The mean value for the vocalised pauses parameter is 2.65. The students found that challenges were more and needed to be worked on properly.

Conclusions

The findings of the study hint at many important conclusions. Students of Class 9 were less aware about all paralinguistic features probably because they have not been taught the theory. Once the theoretical knowledge is gained, it leads to awareness; once awareness is settled, it strengthens the process of acquisition. Overcoming the challenges becomes easy when they get to know

their individual and specific errors instead of group and general errors. If facilities are available and used, the process of understanding is easy, quick and extremely efficient. The amount of effort put in is very high and the process of acquisition is in the right direction. Technology can be instrumental in the exposure to their problems in an extremely befitting way. Display of perfect presentations or videos does not help them learn much as the students need an exposure not for perfection but those hurdles which block the way to perfection. If students are exposed to the acquisition of speaking skills at an early age, the time during the graduation can be devoted to the acquisition of field-specific knowledge.

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Alternative Conceptions in Physics among Secondary School Students

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Abstract

Considering the explorative nature of Physics and its intricate disciplinary characteristics, science educationists were always curious to explore how children learn Physics. It is a well-acknowledged fact that concept acquisition is a very active process wherein learners identify essential attributes and construct new conception integrating with already built conceptions in the mind. During the process of acquisition of concepts, learners may view the world in the form of concepts which are deviant from accepted notion of knowledge which are termed as alternative conceptions. If the alternative conceptions are not dealt at the secondary level, the probability of sustaining those alternative frameworks of conceptions may continue at higher learning too. This research paper attempts to identify alternative conceptions in Physics among secondary school students of D.M. School of Regional Institute of Education (RIE), Bhubaneswar, Odisha. All 9th standard students of D.M. School were considered as the sample. A two-tier concept attainment test and a semi-structured interview were used to collect the data. The data was qualitatively analysed with specific intention to explore students' alternative conceptions in the themes—Motion, Force, Sound, Light and Electricity. The findings suggest that a well-constructed system of pedagogical design is to be integrated in the teaching-learning process so that alternative conceptions in Physics could be redirected to conceptual change among learners.

INTRODUCTION

Physics is an exciting intellectual endeavour which tries to explore knowledge about nature and is an inevitable component of school science as a part of integrated science at secondary level and as a disciplinary study at senior secondary

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stage. However, a disturbing concern at senior secondary stage students is a negative perspective about learning Physics among students. Researches indicate that one of the major causes of this phenomenon is a lack of understanding about basic Physics concepts or students' misconceptions in Physics (Halim, Young and Meerah, 2014). Despite repeated instruction and explanation, students continue with their own understanding of the physical world which is not consistent with well-researched and validated scientific explanations. There are empirical researches pointing to the fact that children's ideas are deviant from scientific explanations (Pathare and Pradhan, 2005; Temiz and Yavuz, 2014; Woldron, 2013) and those ideas which are deviant from scientific conceptions are termed as alternative conceptions.

Wide researches revealed that they are not random guesses, rather they have a deep-rooted mental framework of conceptions underlying in it. Children's ideas have been shown to exhibit a degree of coherence and persistence which suggests links to underlying structures or conceptual frameworks (Driver and Bell, 1986).

Understanding the root cause of these alternative conceptions is also equally interesting. A person's expressions of alternative conceptions are derived from his/her alternative framework of thinking. Learners' prior knowledge interacts with the knowledge presented in formal instructions, resulting in a diverse variety of unintended learning outcomes. In this case, if the alternative conceptions are not dealt at the secondary level, the probability of sustaining the alternative framework of conceptions would continue at higher learning. These are too strong to overcome and can inhibit the process of teaching and learning (Gunstone, 1995). Initial ideas held by students are very difficult to change by teachers despite being presented with scientific concepts (Tsai, 1999; Sencar and Eryilmaz, 2004). Wandersee, Mintzes and Novak (1994) claimed that alternative conceptions have their origins in diverse sets of personal experiences including direct observations and perceptions, peer culture and language and in teachers' explanations and instructional material. It is also claimed that these are tenacious and resistant to extinction by conventional teaching strategies. In this context, it becomes highly necessary to identify those alternative conceptions and attempt for conceptual change considering their significance from the perspective of teaching-learning process.

Genesis of the Study

The significance of 'understanding the learner' in the process of learning necessitates the need for researches on concept formation of learners. Especially in a discipline like Physics, wherein the concepts are closely related to daily life experiences, there is a high probability of developing alternative conceptions.

The research done by Lee et al. (1992) suggests that there are three ways in which alternative conceptions among children differ from generally accepted concepts. First, children have difficulty with the kind of abstract reasoning used by scientists. Second, children are interested in unique explanations for specific events; unlike scientists, they are not concerned with the need for coherent and non-contradictory explanations for a wide variety of phenomena. Third, the everyday language of our society often leads children to have views that are different from those of scientists, and common speech is often at odds with the precise language used by scientists. Once these beliefs are enrooted in the mental structure of the learner, there is a high chance that they might impede future learning, unless provided with very conscious intentional conceptual change experiences. Hewson (1981) proposed two models to explain how alternative conceptions are overcome — either an alternative conception is suppressed and replaced by a correct understanding (conceptual change), or students retain both views.

To bring conceptual change among learners, identifying their alternative conceptions in a reliable and valid way would be the first and foremost step. There were many attempts in the last few decades to diagnose alternative conceptions using different tools/ strategies. However, considering the need for a comprehensive study of alternative conceptions in Physics, the present study has been taken up. Demonstration Multi-purpose School (D.M. School) at Bhubaneswar is one of the model schools of NCERT and is of concern here. In this context, the present study is aimed at understanding indepth, the alternative conceptions possessed by secondary school students in Physics.

Methodology

An explorative study was conducted to identify alternative conceptions in Physics of secondary school students. Both quantitative and qualitative techniques were employed in data collection and analysis.

Sample

The sample of the study were Class 9 students of D. M. School. In total, 97 students including 46 girls and 51 boys participated in the study. A two-tiered test was administered to all the 97 students whereas seven randomly selected students participated in the interview.

Tools

A two-tier concept attainment test consisting of structured multiple choice questions was used to elicit the alternative conceptions among students at secondary level. The first tier includes multiple choice items, followed by a second tier of explanation and justification for choosing the option as the right answer. The advantage of using this approach is that it considers students' reasoning and interpretations behind

their responses. It also reveals the link of their choice to the alternative conceptions that they possess. The test was conducted at Kendriya Vidyalaya, Unit IV of Bhubaneswar on Class 9 students. Content validity of the tool was established and the Cronbach alpha coefficient of reliability was found to be 0.7. The test consisted of 20 items chosen from the themes of secondary school Physics such as Motion, Force, Sound, Light and Electricity. Seven students of Class 9 of D.M. School also participated in a semi-structured interview.

Data Analysis

Although quantitative data was collected and processed in terms of frequencies of the different multiple choice options of students, the main thrust of data analysis for this study is centred on the qualitative data generated from students' justifications for their answers/ responses to the interview questions. The meanings from the statements and explanation given by the students are identified and interpreted in the following section.

Findings and Discussion

The result of the study is categorised under five themes—alternative conceptions in motion, force, sound, electricity and light. The two-tier test and the interview responses were analysed and the interpretations are presented together. In addition, Science textbooks were also analysed with specific consideration to the identified alternative conceptions.

The study revealed that alternative conceptions do exist among students in the just mentioned themes of Physics. The alternative conceptions identified are presented below under various themes with a detailed discussion.

Force

The analysis of the responses obtained to an item wherein students need to explore the forces acting on an object which is at rest on a table reveal that students consider gravitational force as the only force which keeps an object at rest. Their limited understanding of gravitational force is that it is a force which holds objects without allowing them to fly off. The students extrapolate the limited explanation/ examples given in the classroom or textbook to all the situations and ignore the effect or presence of other forces such as frictional forces or normal forces on a body at rest on a table. It leads to a conceptualisation that since gravitational force is acting downward, the object is at rest on a table. This further constraints their understanding about the balanced forces as well. In addition, a few students have another alternative conception that gravitational force acts only on falling objects. It indicates that students' idea of gravitational force is also limited to gravitation due to earth, negating the universal law of gravitation. This alternative conception is also evident from the

responses of a few other students that "there is no gravitational force on moon".

In addition, one of the students thought that there is no net force acting on the book which is at rest on a table, the interpretation given is that *"the book is at rest and therefore no velocity and therefore no force"*. It is apparent that the students relate velocity with force, and not with acceleration. From the response of one of the students, it is clear that the student has an alternative conception that frictional force acts only when objects are in motion. In addition, it is also revealed that students use 'force' and 'pressure' synonymously which indicates that there is no clear differential understanding of these conceptions. It is in agreement with the findings of the researches such as Hestenes, Wells and Swackhamer (1992).

Interpretations to the responses to the item wherein students were supposed to identify what happens to the ball if it is kicked and rolled over the ground for some time, reveal various alternative conceptions of the concepts of 'motion', 'force' and 'energy'. The response—*The ball will move with constant velocity as there will be no force acting on the ball*—reveal that the student could not identify any of the opposing force to change the state of motion of the ball. Since they could not identify any other forces to oppose the motion of the ball, the conception that it moves with constant velocity emerged.

The other response, *"the energy given to the ball by kicking, gets finished and therefore the velocity gets decreased"*, is in contrary to the law of conservation of energy. This indicates an alternative conception that energy is something which gets finished. This might have emerged from the phrase which is commonly used in day-to-day life such as "I lost my energy doing work". At the same time, it reveals students' difficulty in identifying an opposing force to change the state of motion of the ball as well. The response that *"its velocity will be decreased as it is getting frictional force, after sometime the force at which the ball was kicked will be consumed by the frictional force so it will stop at a point or reduce its speed"* also reveals students' idea of opposing force as something which is intended to 'consume' the force applied. Another common alternative conception is that since applied force is reduced, the velocity gets reduced or the ball stops. Students could not identify the presence of opposing forces in this case as well.

Sound

In the study, it was found that students have alternative conceptions about the concept of 'vacuum'. The response of the students such as "inside a balloon, there is vacuum"also points to their alternative framework of thinking. Majority of students have an understanding that sound requires medium to travel, however a few of them responded that the sound cannot

travel in water. The response *"there is no medium in water, only vacuum and sound do not travel through vacuum"* indicates that students' conception of medium and vacuum is vague. Majority of students selected the right choice that we cannot hear the sound when an alarm clock is covered in a glass shell in which air is extracted out, a few of them gave the justification that since glass shell blocks the sound, we are unable to hear the sound. The alternative conception identified is that sound cannot go through the surface of separation of two different media. This is also in corroboration with that of findings of Periago, Pejuan, Jaén and Bohigas (2009) related to students' alternative conception that sound cannot go through the surface of separation of two different media. There are many examples given in Class VIII NCERT textbook (pp. 161–63) to illustrate that sound needs medium to travel. However, lack of examples showing propagation of sound through the surface of separation of two different media might be one of the reasons to sustain the alternative conception developed because of students' day-to-day life experiences.

Electricity

It was found that students have alternative conception about open/ closed circuit. They also think that when the switch is on, current flows to the first bulb, then the second one and so on. The simultaneous glowing of bulb is not reasoned out by students. This is indicated by their response "Since all bulbs A, B, C and D are connected to each other through a wire. If current cannot reach to bulb A (bulb A is fused), then it cannot reach to other bulbs". The direction of electric flow/ current also seems to be misunderstood by a few students. It is also found that students perceive that the bulb which is close to power supply glows first as the current reaches that point first. It confirms the findings of many other researches. The bulb which is farther away from the power supply is dimmer than the closer bulbs (Heller and Finley, 1992; Peşman and Eryilmaz, 2010; Sencar and Eryilmaz, 2004). They have an alternative conception that current moves from positive terminal of battery then to different bulbs and then reaches the negative terminal. Some of the sentences given in the textbook of Class VI (p. 116) such as "A torch has a bulb that lights up when it is switched on" and "Electricity to the bulb in a torch is *provided* by the electric cell". They possess an understanding which is inconsistent with scientific explanation that an electrochemical cell can be a source of charge in a circuit and the charge that flows through the circuit originates in the cell and is used up as it flows through a circuit.

Light

The responses on the first law of reflection reveal that students

have alternative conception that the law holds true only in the case of plane surface. In reality, the laws of reflection are obeyed in the irregular reflection case as well. Only the difference is that because of the irregularities in the surface, the reflected rays are not parallel. The response such as *"light travels in straight path not in rough path"* indicates that students possess an alternative conception that the first law of reflection holds true only in the case of regular reflection. It is evident that students have the conception that reflection happens only in smooth plane surfaces, and not at a rough surface. This kind of misconception can be categorised as 'induced incorrect generalisation'. Mohapatra (1988) attributed the students' failure to generalise the concept of reflection from plane mirror to curved mirrors to a "misconception" process known as induced incorrect generalisation. When the textbook was analysed, it was found that while discussing about irregular reflection, an assertive point is given on page 202 (Textbook for Class VIII) that "remember that the diffused reflection is not due to the failure of law of reflection". However, considering the above-mentioned alternative conception, it is suggested that the concept is explained with a diagram in the textbook on laws of reflection.

Implications

The findings of this study may provide impetus to teachers and curriculum developers for designing classroom activities and teaching strategies that could address students' alternative conceptions in Physics and textbook writers to provide ample visualisations, graphs and explanations to bring more conceptual clarity to the readers. These inputs might be helpful for the science teachers to use various strategies such as conceptual change model to transact the concepts and subsequently science learning of students may be optimised. These results may be considered while planning in-service training programmes to science teachers at the secondary level.

Conclusion

It is highly essential to understand how students process knowledge and conceptualise knowledge structures in the mind. Any effort to identify alternative conceptions in any subject has its significance. For a discipline such as physics, with its complex interwoven concept structures, it is all the more significant to examine the alternative conceptions of learners and its impeding role in concept formation. This consideration suggests that, it is crucial to consider the logical structure of the subject matter and its conceptualisation. Therefore, curriculum planners, the textbook writers and the teachers need to be extra cautious in this aspect and area of research in general.

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Cooperative Learning
An Innovative Practice for Enhancing Leadership and Decision-making Skills through Science Teaching

MARY VINEETHA THOMAS* AND R.G. KOTHARI**

Abstract

In the present era of globalisation, where more stress is on a skilled workforce, opportunities for our students often depend as much on their communication and collaboration skills as they do on pure academic skills. This requires quality education and an important factor that affects the quality of education is the teaching-learning process. Quality management of the teaching-learning process demands innovative methods and experiments to be brought into our classrooms. It should focus on the all-round development of the learner. One such strategy promoting this aspect is Cooperative Learning (CL). CL has five essential elements: positive interdependence, face-to-face promotive interaction, individual accountability, appropriate use of collaborative skills and group processing. Collaborative skills include leadership skills, communication skills, trust-building skills, decision-making skills and skills of resolving conflicts. This paper focuses on how cooperative learning environment fosters development of collaborative skills of leadership and decision-making among Class 7 students through science teaching.

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Introduction

In the present era, globalisation has made its impact on all sectors of the society and education is no exception. What is needed at the hour is a globally competent workforce. Learners need to be having global skills that would help them survive and compete in the global world. This stresses the importance of quality education and an important factor that affects the quality of education is the teaching-learning process. This calls for a change in the present teaching-learning process. We need to come up with innovative and quality teaching methods that would help in the all-round development of learners. Today, opportunities for present generation students often depend as much on their communication and collaboration skills as they do on pure academic skills. The changing scenario of workplace requires responsibility and self-management, as well as interpersonal and project management skills that demand teamwork and leadership. According to UNESCO (1996), children should be taught to understand other people's reactions by looking at things from their point of view.

From early childhood, education should focus on the discovery of other people in the first stage of education. In the second stage it should encourage involvement in common projects. According to the National Curriculum Framework (NCF)–2000, at the upper primary stage children endeavour to establish an identity of their own (NCERT, 2000). The process of identity formation requires taking into account one's own view as well as the views of others and of the society. Thus, the importance of peer group increases considerably. It also stresses on promoting constructivist approach in classrooms which leads to learners having autonomy for their own learning and opportunities for peer collaboration and support. Thus one of the essential tools for education in the 21st century must be a suitable forum for dialogue and discussion. One such strategy promoting this aspect is Cooperative Learning (CL). The present study focuses on the effectiveness of Cooperative Learning as a strategy for improving collaborative skills of leadership and decision-making of Class 7 students while teaching science.

Review of Related Studies

CL is not only an instructional technique for increasing student achievement but is also one that has important benefits for a wide array of affective and interpersonal outcomes. Thomas (1995) found that individuals in cooperative groups exerted social pressures on one another to achieve. Ryan and Wheeler (1977) found that students who had studied cooperatively made more cooperative and helpful decisions in a simulation game than students who had studied competitively. Bridgeman (1977) reported that students who had worked cooperatively using Jigsaw technique were able to take the

perspective of another person better than the control students. Shachar (2003) reviewed eight studies that investigated children's academic achievement and social behaviour in elementary and high school students. It was found that children from all three ability levels (high, medium, low) benefitted from CL and these benefits included academic and social gains. Ryan, Reid and Epstein (2004) also found that CL experiences enhanced the development of positive social attitudes towards other group members in students with emotional and behavioural disorders.

A study by Battistich and Watson (2003) revealed that CL experiences enhance the development of positive social attitudes towards other group members. Kishore (2012) also found that social acceptability of students increased after undergoing CL. From the above findings we can conclude that CL may enhance the kinds of pro-social behaviours that are needed in the present globalised society where the ability to get along with others is becoming more and more crucial, thereby strengthening the need to promote CL as an instructional strategy in our educational institutions.

Cooperative Learning

According to Johnson and Johnson (1994), cooperative learning is an instruction that involves students working in teams to accomplish a common goal, under conditions that include the following five essential elements.

1. **Positive interdependence** — Team members are obliged to rely on one another to achieve the goal. If any team member fails to do his/her part, everyone suffers from the consequences.
2. **Individual accountability** — All students in a group are held accountable for doing their share of the work and for mastery of all of the material to be learned.
3. **Face-to-face promotive interaction** — Although some of the group work may be parcelled out and done individually, some must be done interactively, with group members providing one another with feedback, challenging reasoning and conclusions, and perhaps most importantly, teaching and encouraging one another.
4. **Appropriate use of collaborative skills** — Students are encouraged and helped to develop and practice trust-building, leadership, decision-making, communication and conflict management skills.
5. **Group processing** — Team members set group goals, periodically assess what they are doing well as a team, and identify changes they will make to function more effectively in the future.

There are many CL techniques that can be used in classrooms. In the present study, only six cooperative learning techniques were used out of the many mentioned. They are Jigsaw, Student Team Achievement Division (STAD), Group Investigation, Team Game Tournament (TGT),

Round Robin Brainstorming and Think-Pair-Share.

Objective of the Study

To study the effectiveness of strategy based on CL on collaborative skills like leadership and decision-making of Class 7 students.

Hypotheses of the Study

1. There will be no significant difference in the collaborative skill of leadership of students before and after implementation of cooperative learning.
2. There will be no significant difference in the collaborative skill of decision-making of students before and after implementation of cooperative learning.

Explanation of Terms

Strategy based on CL

The present study used a strategy based on cooperative learning in which small teams, each with students of different levels of ability, use a variety of learning activities to improve their understanding of a subject. The strategy took care of the five essential elements of cooperative learning and the techniques of cooperative learning like Jigsaw, STAD, TGT, Group Investigation, Round Robin Brainstorming and Think-Pair-Share. And the same was linked with identified content areas of Class 7 science and accordingly lesson plans designed.

Leadership and Decision-making Skills

The present paper focuses on skills of leadership and decision-making coming under collaborative skills which is the fourth essential element of cooperative learning. In the present study, it refers to the basic simple leadership and decision-making skills which can be developed in students through cooperative learning techniques while engaged in science learning.

Delimitation of the Study

The study was delimited to government English medium upper primary schools.

Population and Sample

All Class 7 students (approximately 8,400 students) of Ernakulam district formed the population of the study. Non-probability sampling technique, purposive sampling, was used. Thirty-six students from a government English medium school following Kerala State Board syllabus formed the sample of study.

Tool

A five-point rating scale was developed for assessing collaborative skills of students in cooperative learning (1–never, 2–rarely, 3–occasionally, 4–frequently and 5–always). For leadership skills the following five items were included — Performing assigned role and helping others to do so; Involving, valuing and recognising contributions of all team

members; Effectively managing time; Summarising results and next steps before finishing; and Maintaining focus and keeping to the point in conversations. For decision-making skills, the following three items were included—pulls together all ideas into a single position, defends/rethinks ideas relating to the group's goals and directing the group in reaching consensus. Only few items mentioned above were included because students were assessed in between their learning of science. This was to assess the very basic leadership and decision-making skills that would develop when students were learning science and involved in science activities during their regular science classes only.

Data Collection

Data was collected for one term of the year, i.e., six months. In one term there are five chapters to be taught in science. Before implementing CL, the students were rated on these skills. Then the respective five chapters in science were taught using the strategy based on cooperative learning techniques. They were also rated after each chapter and finally at the end of all chapters.

Data Analysis

Rating scale was used to assess students. Scoring was done accordingly and the corresponding average means during each rating was found. A graph was plotted for each of the skill using the mean values of the skills corresponding to each rating (Figures 1 and 2).

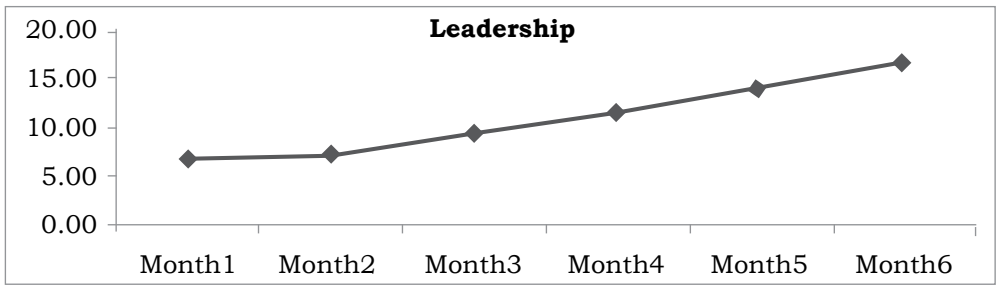

Figure 1. Leadership

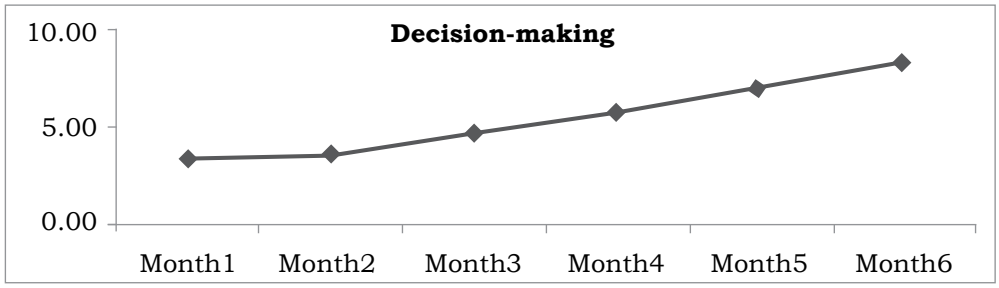

Figure 2. Decision-making

The development of the essential elements was thus seen but in order to see if the increase is significant or not, the Wilcoxon Signed Rank Test was used (Tables 1 and 2). The Wilcoxon Signed Rank Test is the non-parametric test used to compare two sets of scores that come from same participants. It is used in studies that gather before and after measurements where interest focuses on the difference between the observations for each individual. From the six ratings the initial and final rating was used. The results are given below. In this test, if p-value obtained is less than 0.05 the null hypothesis will be rejected.

Table 1
Leadership

	Z-value	**p-value**
Performing assigned role and helping others to do so	-5.352	0.001
Involving, valuing and recognising contributions	-5.345	0.001
Effectively managing time	-5.489	0.001
Summarising results and next steps before finishing	-5.436	0.001
Maintaining focus and keeping to the point	-5.558	0.001
Leadership	-5.252	0.001

From Table 1, it can be seen that the p-value is less than 0.05. This implies that the null hypothesis "There is no significant difference in leadership skills of experimental group students before and after cooperative learning" is rejected.

Table 2
Decision-making

	Z-value	**p-value**
Pulls together all ideas into a single position	-5.466	0.001
Directing the group in reaching con-sensus	-5.242	0.001
Defends/ rethinks ideas relating to the group's goals	-4.975	0.001
Decision-making	-5.248	0.001

The null hypothesis formulated here was "There is no significant difference in decision-making skills of experimental group students before and after cooperative learning". The p-value obtained is less than 0.05 and thus the null hypothesis is rejected.

Findings of the Study

- It was found that there was a significant difference in leadership skills of students after undergoing cooperative learning. Students developed leadership skills in them after learning through cooperative learning techniques and the improvement was significant.
- There was a significant difference in decision-making skills of students before and after cooperative learning. Students developed decision-making skills

after implementation of cooperative learning. They showed a significant improvement in skill of decision-making after learning through cooperative learning techniques.

Discussion

The Wilcoxon Signed Rank Test clearly indicates that there was a significant increase in leadership skills of students after undergoing CL. Initially students performed their assigned roles but did not give attention to how and what their group members performed. They did not consider it important to involve, value and recognise the contribution of their group members. Many a times they could not maintain focus and keep to the point of discussion. They would deviate into other topics. As a result, time management was not possible and they could not summarise their results before finishing. It was however seen that while learning through CL techniques, these aspects of students started undergoing change and by the end of the term they portrayed leadership skills as was desired. Along with performing their assigned roles, they also helped their group members to do so and even start involving, valuing and recognising the contributions of their group members. During group activities they started managing time effectively by maintaining focus on the topics of discussion. It also helped them in summarising results and steps before finishing their group work.

There was a significant increase in decision-making skills of students after undergoing CL and this was supported by the results of Wilcoxon Signed Rank Test. In the beginning, students were hardly able to relate and direct all ideas into a single position. They never defended or thought again on ideas relating to their group's goal. As CL progressed, this situation started changing and it could be seen that students started directing their group in reaching consensus. They started defending and rethinking ideas relating to their group's goals and started directing all ideas into a single position thereby showing improved signs of decision-making. These findings go in line with the findings of many studies. A study by Hertz-lazarowitz, Sharan and Steinberg (1980) showed that students who had experienced Group Investigation made more altruistic choices than the control students. It was seen that when students who had worked in cooperative groups were reassigned to new groups for an experimental task, they cooperated better and their groups had higher productivity than groups made from the control classes. Ryan and Wheeler (1977) found that students who had studied cooperatively made more cooperative and helpful decisions in a simulation game than the students who had studied competitively. According to Slavin (1995), two of the most important components of students' self-esteem are the feeling that they are well-liked by their peers

and the feeling that they are doing well academically. CL methods affect both of these components, and thus, CL could in fact increase students' self-esteem. Students' beliefs that they are valuable and important individuals are of critical importance for their ability to withstand the disappointments of life, to be confident decision-makers, and ultimately to be happy and productive individuals.

Conclusion

The study revealed that students significantly improved on collaborative skills like leadership and decision-making while learning science through cooperative learning. Engaging primary students in such learning activities will help build the basic skills of leadership and decision-making and from this advanced skills can then be developed in higher classes using professional activities and training. Implementing CL and assessing students in CL, however, needs a lot of patience and time and is not an easy task. Syllabus should be framed in such a way that it gives ample scope for implementing CL along with being able to be completed on time. Policy-makers and school authorities should see to it that appropriate tools needed for assessing students in CL be designed by a panel of experts and be given to teachers of all schools. Teachers should also be given training for constructing valid tools for CL and its five essential elements during workshops and training programmes. This would help reduce burden of teachers and also maintain uniformity in assessments made by all teachers. Teachers new to CL can start with those techniques of CL with which they feel most comfortable. Quality education can be achieved only with quality curriculum transaction and hence it is essential to gear up our education system using innovative initiatives. Using cooperative learning in our classrooms will definitely be a step in this regard.

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Academic Achievement of Senior Secondary School Students

An Analysis on the basis of Self-regulated Learning and Some Demographic Variables

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Abstract

The present study was undertaken to examine the academic achievement of senior secondary school students in relation to self-regulated learning and demographic variables (type of school and gender). Academic achievement was treated as a dependent variable whereas self-regulated learning (High, Average and Low), and demographic variables — type of school (Government and Private) and gender (Male and Female) — were treated as independent variables. Descriptive survey method was employed for the present study. A sample of 600 students was taken using multi-stage stratified random sampling technique. Self-regulated Learning Scale by Gupta and Mehtani (2017) was used to collect the data and Three-way ANOVA with 3×2×2 factorial design was used to analyse the data. Levene's Test of Homogeneity of Variance was also applied to test the assumption of homogeneity of variance for ANOVA. Main effect of self-regulated learning, type of school and gender on academic achievement of senior secondary school students was found to be significant. No significant interaction effect of self-regulated learning and gender was reported on academic achievement of senior secondary school students. On the other side, significant interaction effect of self-regulated learning and type of school and type of school and gender was reported on academic achievement of senior secondary school students. Triple interaction effect of self-regulated learning, type of school and gender on academic achievement of senior secondary school students was found to be insignificant.

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Introduction

In the present era of globalisation and technological revolution, education is considered as the first step for every human activity. It plays a vital role in the development of human capital and is linked with an individual's well-being and opportunities for better living (Battle and Lewis, 2002). It is the most persuasive mechanism for the advancement of human beings which widens, enriches and improves an individual's image of the future. It is the principle instrument in awakening the child to cultural values, preparing for later professional training and also in helping to adjust to the environment.

Education develops an individual like a flower and has been regarded as a source of illumination and power. It nurtures the inquisitiveness and curiosity in individuals. It is education that brings confidence in child to take decisions, to face the various situations and also to accept successes and failures in life. In fact, a man without education is no more than an animal.

Today, the world is becoming more and more competitive and quality of performance is the key factor for personal progress. Excellence, particularly in academic area, is seen as an important aspect. It has been noticed that those who have better academic achievement are better placed in the society. Academic achievement holds a cardinal place in the field of education and is considered as an outstanding inducement for the progress of individuals. It is the acquisition of knowledge, understanding and skills in a specified academic subject or group of subjects and also the most desirable outcome of school life. It is an index of students' performance, teachers' efforts and attainment of educational objectives. As it is the unique responsibility of all educational institutions to promote scholastic achievement of the students, all the activities of school revolve around one chief aim, i.e., maximising the academic achievement of the students. Administrators, educators, curriculum planners, teachers and students work to make teaching-learning process feasible for academic excellence. Thus, there is a need to know the factors which contribute towards high achievement and also the factors which act as barriers towards attainment of high academic achievement.

Home environment, self-regulated learning, gender, type of school, parental support, locality, study habits, academic stream, etc., have their significant effect on academic achievement of the students. Williams and Hellman (2004) concluded that student's self-regulation is generally accepted as an important construct in students' success. On the other hand, Pelt (2008) found that there exists no significant relationship between self-regulated learning and academic achievement. However, the results showed that high-achievers used more self-regulated learning and

more advanced strategies than the low achieving students. Achufusi-Aka and Offiah (2010) found that there exists a significant difference in the academic achievement of students exposed to academic self-regulation and the students taught with lecture method. Adetayo and Kiadese (2011) found that parental involvement is the predictor of students' achievement in financial accounting and significant relationship exists between parental involvement and academic achievement of the students. Chika, Obodo and Okafor (2015) found that self-regulated learning strategies enhanced higher students' achievement in basic science than the conventional method. Agustiani, Cahyad and Musa (2016) concluded that self-regulation of learning and academic achievements are positively correlated which implies that if one of these variables experiences a positive or negative change, the other two will also experience change.

Review of literature makes it clear that only a few researches have been done which focus on the effect of self-regulated learning on academic achievement of students. Not a single research is there to know the main effects and interaction effects of self-regulated learning, type of school and gender on academic achievement of senior secondary school students. Thus, the present study is an endeavour to investigate the academic achievement among senior secondary school students with reference to self-regulated learning and demographic variables (type of school and gender).

Variables Used

- Dependent Variable: Academic Achievement
- Independent Variables: Self-regulated Learning, Demographic Variables (Type of School and Gender)

Objectives of the Study

1. To study the main effect of: (a) self-regulated learning; (b) type of school; and (c) gender on academic achievement of senior secondary school students.
2. To study the interaction effect of: (a) self-regulated learning and type of school; (b) type of school and gender; and (c) self-regulated learning and gender on academic achievement of senior secondary school students.
3. To study the interaction effect of self-regulated learning, type of school and gender on academic achievement of senior secondary school students.

Hypotheses of the Study

$\mathbf{H_{01}}$: There exists no significant effect of: (a) self-regulated learning; (b) type of school; and (c) gender on academic achievement of senior secondary school students.

$\mathbf{H_{02}}$: There exists no significant interaction effect of: (a) self-regulated learning and type of school; (b) type of school and

gender; and (c) self-regulated learning and gender on academic achievement of senior secondary school students.

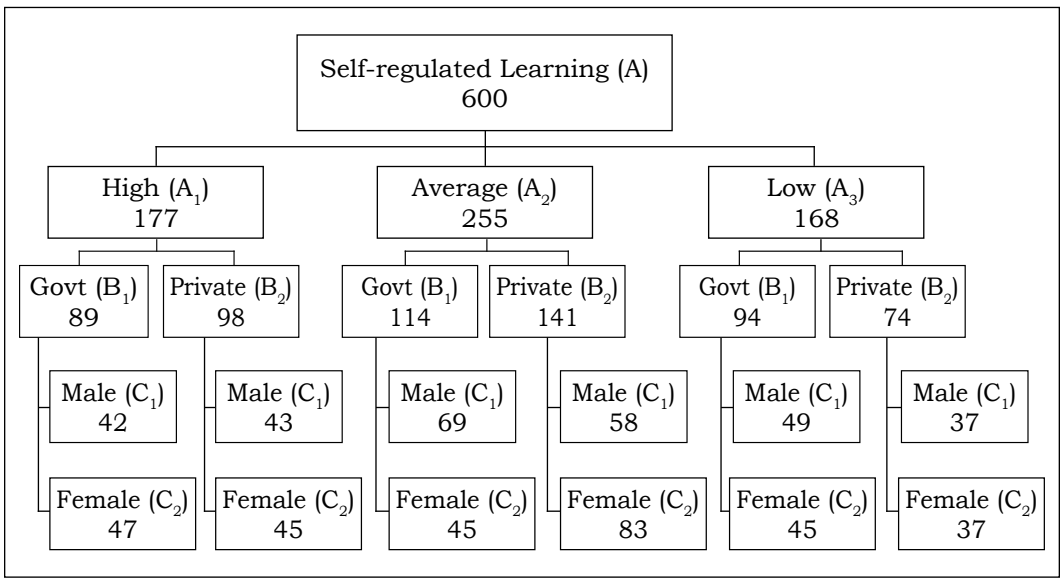
$\mathbf{H_{03}}$: There exists no significant interaction effect of self-regulated learning, type of school and gender on academic achievement of senior secondary school students.

Design and Methodology

In the present study, descriptive survey method was used. Multi-stage stratified random sampling technique was used to select the sample of 600 senior secondary school students of Haryana. The 3×2×2 factorial randomised group design was used to analyse the data. The sample was further stratified on the basis of self-regulated learning, i.e., High (177), Average (255) and Low (168); type of school, i.e., Government (297) and Private (303); and also on the basis of gender, i.e., Male (302) and Female (298). Distribution of the sample on the basis of self-regulated learning, type of school and gender has been depicted next.

Tool Used

Self-regulated Learning Scale by Gupta and Mehtani (2017) was used to assess the level of self-regulated learning among senior secondary school students. This scale consists of 48 statements to measure self-regulated learning of the students with six dimensions — self-awareness, planning and goal-setting, self-monitoring, self-control, self-evaluation and self-modification. Test-retest reliability of the scale is



0.88 and Split-half reliability is 0.982. The scale has high construct validity which ranged from 0.503 to 0.596.

Academic achievement of the students was determined on the basis of marks obtained in previous class (Class 10 marks).

Statistical Techniques Used

The data was analysed using descriptive as well as inferential statistics. The Three-way Analysis of Variance (ANOVA) with 3×2×2 factorial design was computed using SPSS version 20 to study the main effects and interaction effects of the independent variables, i.e., self-regulated learning, type of school and locality on academic achievement of senior secondary school students. Levene's Test of Homogeneity of Variance was used to test the assumption of homogeneity of variance before applying Three-way ANOVA. Wherever F-value was found significant, 't'-test was employed for further investigation.

Data Analysis and Interpretation

The objective of the present study was to find out the main and interaction effects of self-regulated learning, type of school and gender on academic achievement of senior secondary school students. For this, the data was subjected to analysis of variance (ANOVA) of a 3×2×2 factorial study with a randomised group design. The independent variables 'self-regulated learning', 'type of school' and 'gender' were coded as A, B and C respectively. The independent variable 'self-regulated learning' varied into three ways as: High (A_1), Average (A_2) and Low (A_3). On the other hand, independent variables 'type of school' and 'gender' varied into two ways as: Government (B_1) and Private (B_2); and Male (C_1) and Female (C_2) respectively. The Mean and Standard Deviation (S.D.) of different sub-samples have been presented in Table 1 and Figure 1. The summary of ANOVA (3×2×2 factorial design) has also been presented in Table 2, which is analysed in terms of main effects and interaction effects.

Table 1
Mean and S.D. of Sub-samples of 3×2×2 Factorial Design for Academic Achievement of Senior Secondary School Students in relation to Self-regulated Learning (A), Type of School (B) and Gender (C)

Self-regulated Learning (A)	Type of School (B)	Male (C_1)	Female (C_2)
High (A_1)	Govt (B_1)	N= 42 Mean=68.00 SD=14.014	N= 47 Mean=76.04 SD=12.539
	Private (B_2)	N= 43 Mean=81.35 SD= 11.848	N= 45 Mean=83.91 SD=13.828

Average (A_2)	Govt (B_1)	N= 69 Mean=62.23 SD=11.043	N= 45 Mean=69.69 SD=12.544
	Private (B_2)	N= 58 Mean=68.62 SD=11.231	N=83 Mean=70.96 SD=11.466
Low (A_3)	Govt (B_1)	N= 49 Mean=58.63 SD=10.136	N= 45 Mean=65.80 SD=12.195
	Private (B_2)	N= 37 Mean=64.65 SD=13.00	N= 37 Mean=66.24 SD=13.604

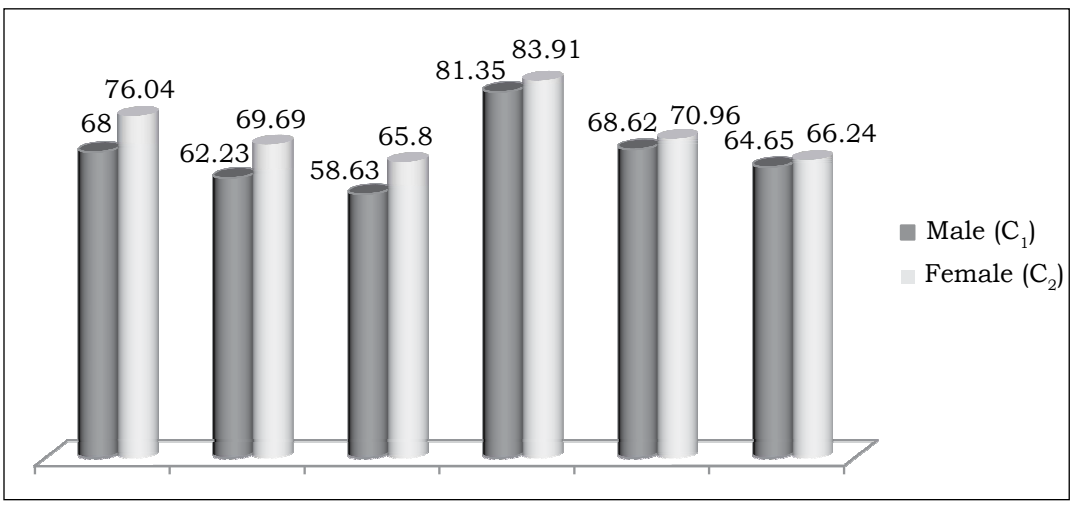


Figure 1. Mean Scores of Sub-samples of 3×2×2 Factorial Design for Academic Achievement of Senior Secondary School Students in relation to Self-regulated Learning, Type of School and Gender

Table 2
Summary of Three-way ANOVA (3×2×2 Factorial Design) for Academic Achievement of Senior Secondary School Students in relation to Self-regulated Learning, Type of School and Gender

Sources of Variance	df	Sum of Squares (SS)	Mean Sum of Squares (MSS)	F-ratio
A (Self-regulated Learning)	2	16772.090	8386.045	56.677**

B (Type of School)	1	4931.604	4931.604	33.330**
C (Gender)	1	3359.130	3359.130	22.703**
A x B Interaction	2	1528.192	764.096	5.164**
B x C Interaction	1	1032.041	1032.041	6.975**
C x A Interaction	2	18.204	9.102	0.62 (NS)
A x B x C Interaction	2	1.545	1471.648	0.005 (NS)
Between Cells Within Cells	11 588	116025.398 87001.639	..... 147.962	
Total	599			

*Notes: ** Significant at 0.01 level; * Significant at 0.05 level; NS= Not Significant*

Main Effect of Self-regulated Learning, Type of School and Gender on Academic Achievement of Senior Secondary School Students

Self-regulated Learning (A)

From Table 2, it is clear that F-ratio for the main effect of self-regulated learning on academic achievement of senior secondary school students (56.677) is significant at 0.01 level leading to the conclusion that self-regulated learning has a significant effect on academic achievement of senior secondary school students. Therefore, the null hypothesis H_{01}(a), "There exists no significant effect of self-regulated learning on academic achievement of senior secondary school students," is rejected. Further, t-test was employed to find out the significance of difference between mean academic achievement scores for different groups. The results have been shown in Table 3.

Table 3
t-values for the Mean Academic Achievement Scores of Senior Secondary School Students with respect to Self-regulated Learning

Self-regulated Learning		N		Mean		S.D.		t-value
HIGH	LOW	177	168	77.42	63.55	14.296	12.465	9.63**
AVERAGE	LOW	255	168	67.84	63.55	11.964	12.465	3.52**
HIGH	AVERAGE	177	255	77.42	67.84	14.296	11.964	7.31**

*Notes: ** Significant at 0.01 level; *Significant at 0.05 level; NS: Not Significant*

Table 3 illustrates that t-value for the mean academic achievement scores of senior secondary school students belonging to high and low self-regulated learning groups (9.63) is significant at 0.01 level. In terms of mean, it was found that mean academic achievement scores of senior secondary school students with high self-regulated learning (77.42) are higher than those students with low self-regulated learning (63.55). It shows that the students with high self-regulated learning have high academic achievement as compared to the students with low self-regulated learning. Table 3 also reveals that t-value for the mean academic achievement scores of senior secondary school students belonging to average and low self-regulated learning groups (3.52) is significant at 0.01 level. Mean academic achievement scores of senior secondary school students with average self-regulated learning (67.84) are higher than those students with low self-regulated learning (63.55). It shows that senior secondary school students with average self-regulated learning have high academic achievement as compared to the students with low self-regulated learning. It is also clear from Table 3 that t-value for the mean academic achievement scores of senior secondary school students belonging to high self-regulated learning and average self-regulated learning groups (7.31) is significant at 0.01 level. Mean academic achievement scores of senior secondary school students with high self-regulated learning (77.42) are higher than senior secondary school students with average self-regulated learning (67.84) or low self-regulated learning (63.55). It shows that senior secondary school students with high self-regulated learning have more academic achievement as compared to their counterparts.

Type of School (B)

It is observed from Table 2 that F-ratio for the main effect of type of school on academic achievement of senior secondary school students (33.330) is significant at 0.01 level, which indicates that type of school has a significant effect on academic achievement of senior secondary school students. Therefore, the null hypothesis H_{01}(b), "There exists no significant effect of type of school on academic achievement of senior secondary school students," is rejected. Further, t-test was employed to find out the significance of difference between mean academic achievement scores for different groups. The results have been shown in Table 4.

Table 4
t-value for the Mean Academic Achievement Scores of Government and Private Senior Secondary School Students

Group	N	Mean	S.D.	t-value
Govt	297	66.31	13.140	5.63**
Private	303	72.56	13.983	

*Notes: ** Significant at 0.01 level;*
**Significant at 0.05 level;*
NS: Not Significant

It can be inferred from Table 4 that t-value for the mean academic achievement scores of government and private senior secondary school students (5.63) is significant at 0.01 level. In the context of mean scores, it is found that the mean academic achievement scores of private senior secondary school students (72.56) are higher than mean academic achievement scores of government senior secondary school students (66.31).

Gender (C)

It is clear from Table 2 that F-ratio for the main effect of gender on academic achievement of senior secondary school students (22.703) is significant at 0.01 level, which shows that gender has a significant effect on academic achievement of senior secondary school students. Therefore, the null hypothesis H_{01} (c), "There exists no significant effect of gender on academic achievement of senior secondary school students," is rejected. Further, t-test was employed to find out the significance of difference between mean academic achievement scores for different groups. The results have been shown in Table 5.

Table 5
t-value for the Mean Academic Achievement Scores of Male and Female Senior Secondary School Students

Group	N	Mean	S.D.	t-value
Male	298	66.76	13.569	4.81**
Female	302	72.15	13.760	

*Notes: ** Significant at 0.01 level;*
**Significant at 0.05 level;*
NS: Not Significant

It can be inferred from Table 5 that t-value for the mean academic achievement scores of male and female senior secondary school students (4.81) is significant at 0.01 level. In the context of mean scores, it is found that the mean academic achievement scores of female senior secondary school students (72.17) are higher than mean academic achievement scores of male senior secondary school students (66.76).

Double Interaction Effect of Self-regulated Learning, Type of School and Gender on Self-regulated Learning of Senior Secondary School Students

Self-regulated Learning (A)×Type of School (B)

It is evident from Table 2 that F-ratio between self-regulated learning and type of school (5.164) is significant at 0.01 level, which indicates that self-regulated learning (A) and type of school (B) interact with each other and have a significant interaction effect on academic achievement of senior secondary school students. Therefore, the null hypothesis H_{02}(a), "There exists no significant interaction effect of self-regulated learning and type of school on academic achievement of senior secondary school students," is rejected. Further, t-test was employed to find out the significance of difference between mean academic achievement scores for different groups. The results have been shown in Table 6.

Table 6
t-values for Mean Academic Achievement Scores of Senior Secondary School Students for Different Groups of Self-regulated Learning (A) × Type of School (B)

Groups	N		Mean		S.D.		t-value
A_1B_1 vs A_2B_1	89	114	72.25	65.18	13.783	12.168	3.82**
A_1B_2 vs A_2B_2	88	141	82.66	70.00	12.889	11.389	7.54**
A_1B_1 vs A_2B_2	89	141	72.25	70.00	13.783	11.389	1.29(NS)
A_1B_2 vs A_2B_1	88	114	82.66	65.18	12.889	12.168	9.77**
A_1B_1 vs A_1B_2	89	88	72.25	82.66	13.783	12.889	5.18**
A_2B_1 vs A_2B_2	114	141	65.18	70.00	12.168	11.389	3.23**
A_2B_1 vs A_3B_1	114	94	65.18	62.06	12.168	11.676	3.12**
A_2B_2 vs A_3B_2	141	74	70.00	65.45	11.389	13.239	2.51*
A_3B_1 vs A_3B_2	94	74	62.06	65.45	11.676	13.239	1.73 (NS)
A_2B_1 vs A_3B_2	114	74	65.18	65.45	12.168	13.239	0.14 (NS)
A_2B_2 vs A_3B_1	141	94	70.00	62.06	11.389	11.676	5.16**
A_1B_1 vs A_3B_1	89	94	72.25	62.06	13.783	11.676	5.39**
A_1B_2 vs A_3B_2	88	74	82.66	65.45	12.889	13.239	8.35**
A_1B_1 vs A_3B_2	89	74	72.25	65.45	13.783	13.239	3.21**
A_1B_2 vs A_3B_1	88	94	82.66	62.06	12.889	11.676	11.26**

*Notes: ** Significant at 0.01 level; * Significant at 0.05 level; NS: Not Significant; A_1= High SRL; A_2=Average SRL; A_3 = Low SRL; B_1= Govt and B_2= Private*

From a close perusal of Table 6, it is evident that t-values 3.82, 7.54, 9.77, 5.18, 3.23, 3.12, 5.16, 5.39, 8.35, 3.21 and 11.26 for the groups (A_1B_1 vs A_2B_1), (A_1B_2 vs A_2B_2), (A_1B_2 vs A_2B_1), (A_1B_1 vs A_1B_2), (A_2B_1 vs A_2B_2), (A_2B_1 vs A_3B_1), (A_2B_2 vs A_3B_1), (A_1B_1 vs A_3B_1), (A_1B_2 vs A_3B_2), (A_1B_1 vs A_3B_2) and (A_1B_2 vs A_3B_1) respectively are found significant at 0.01 level. Further, it is clear from Table 6 that t-value 2.51 for the group (A_2B_2 vs A_3B_2) is significant at 0.05 level. Table 6 also reveals that t-value 1.29, 1.73 and 0.14 for the groups (A_1B_1 vs A_2B_2), (A_3B_1 vs A_3B_2), and (A_2B_1 vs A_3B_2) respectively is not significant at 0.01 level. The mean achievement scores of secondary school students for different groups of self-regulated learning and gender have also been presented in Figure 2.

Type of School (B) × Gender (C)

Table 2 further concludes that F-ratio between type of school and gender (6.975) has been found significant at 0.01 level, which leads to the inference that type of school (B) and

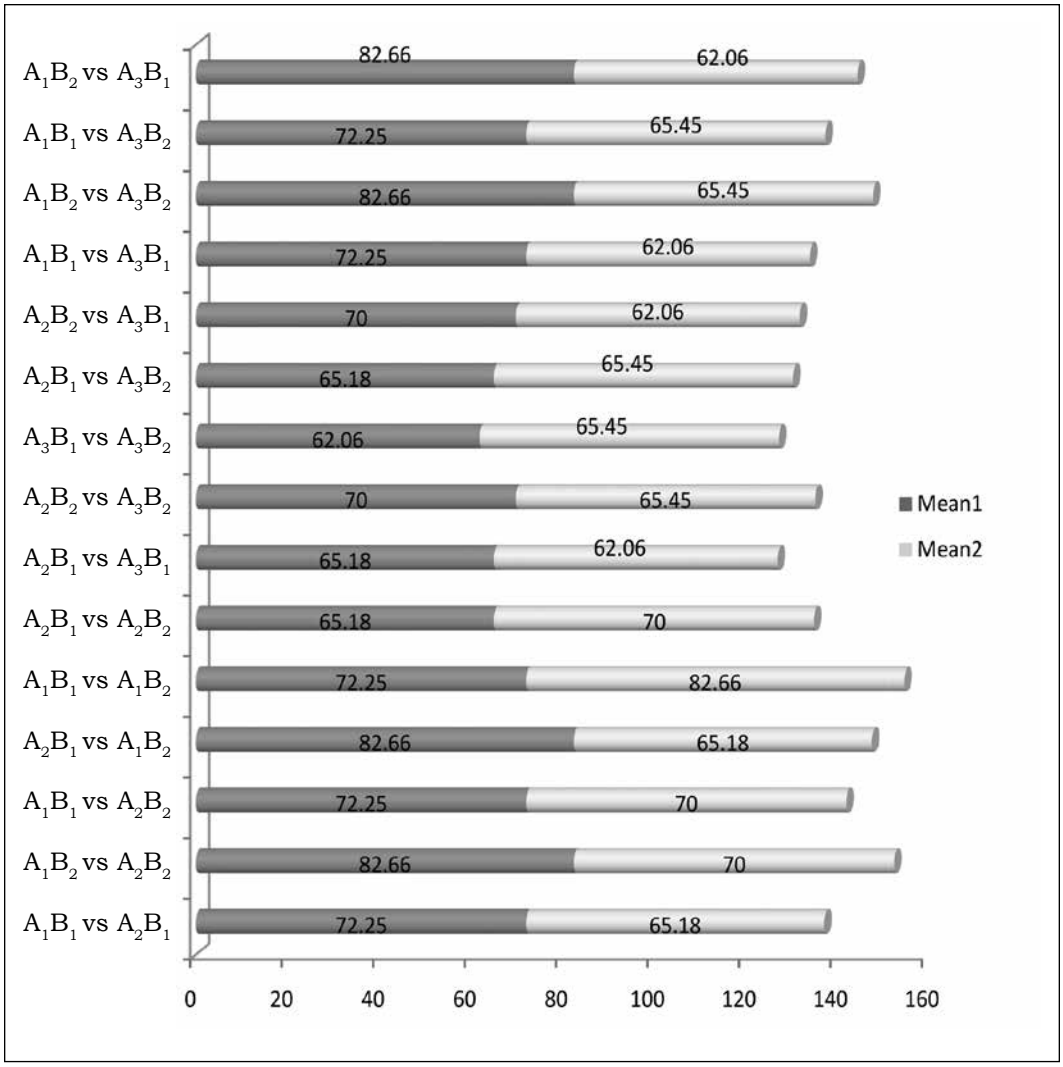


Figure 2. Mean Academic Achievement Scores of Senior Secondary School Students for Different Groups of Self-regulated Learning (A) × Gender (B)

gender (C) interact with each other. Therefore, the null hypothesis H_{02}(b), "There exists no significant interaction effect of type of school and gender on academic achievement of senior secondary school students," is rejected. Further, t-test was employed to find out the significance of difference between mean academic achievement scores for different groups. The results have been shown in Table 7.

Table 7
t-values for Mean Academic Achievement Scores of Senior Secondary School Students for Different Groups of Type of School (B)×Gender (C)

Groups	N		Mean		S.D.		t-value
B_1C_1 vs B_2C_1	160	138	62.64	71.52	12.100	13.659	5.88**
B_1C_2 vs B_2C_2	137	165	70.59	73.44	13.051	14.232	1.82 (NS)
B_1C_1 vs B_2C_2	160	165	62.64	73.44	12.100	14.232	7.35**
B_1C_2 vs B_2C_1	137	138	70.59	71.52	13.051	13.659	0.58 (NS)
B_1C_1 vs B_1C_2	160	137	62.64	70.59	12.100	13.051	5.41**
B_2C_1 vs B_2C_2	138	165	71.52	73.44	13.659	14.232	1.19 (NS)

*Notes: ** Significant at 0.01 level; * Significant at 0.05 level; NS: Not Significant;*
B_1 = Govt; B_2 = Private; C_1 = Male; C_2 = Female

Table 7 discloses that t-values 5.88, 7.35 and 5.41 for the groups (B_1C_1 vs B_2C_1), (B_1C_1 vs B_2C_2) and (B_1C_1 vs B_1C_2) respectively have been found significant at 0.01 level leading to the conclusion that these groups differ significantly on academic achievement. Table 7 further indicates that t-values 1.82, 0.58 and 1.19 for the groups (B_1C_2 vs B_2C_2), (B_1C_2 vs B_2C_1) and (B_2C_1 vs B_2C_2) have not been found significant which means Govt female (B_1C_2) and Private female (B_2C_2); Govt female (B_1C_2) and Private male (B_2C_1); and Private male (B_2C_1) and Private female (B_2C_2) senior secondary school students do not differ significantly with respect to academic achievement. The mean achievement scores of secondary school students for different groups of type of school and gender have also been presented in Figure 3.

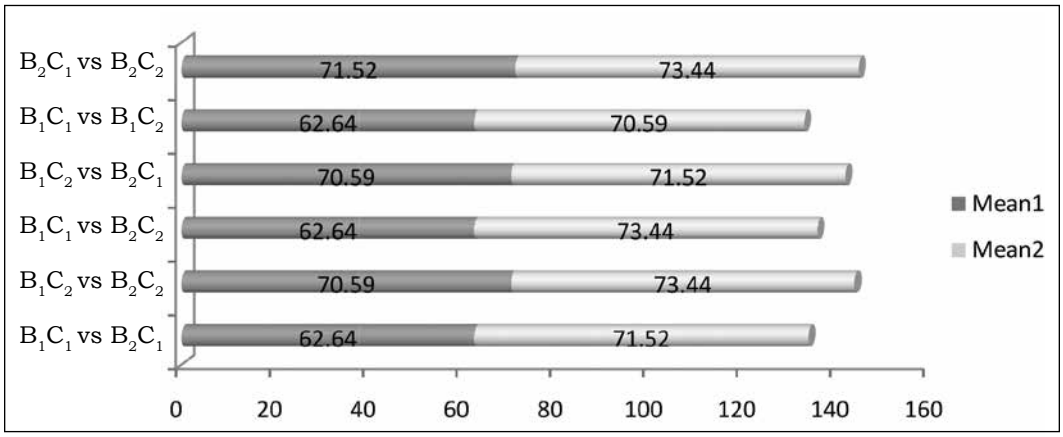


Figure 3. Mean Scores for Interaction Effect of Type of School and Gender on Academic Achievement of Senior Secondary School Students

Self-regulated Learning (A) × Gender (C)

A glance at Table 2 indicates that F-ratio between self-regulated learning and gender (0.062) has not been found significant at 0.05 level leading to the conclusion that self-regulated learning (A) and gender (C) do not interact with each other. Therefore, the null hypothesis H_{02}(c), "There exists no significant interaction effect of self-regulated learning and gender on academic achievement of senior secondary school students," is accepted.

Triple Interaction Effect of Self-regulated Learning, Type of School and Gender on Academic Achievement of Senior Secondary School Students

Self-regulated Learning (A) × Type of School (B) × Gender (C)

Table 2 further indicates that the F-ratio (0.005) for the triple interaction effect of self-regulated learning, type of school and gender on academic achievement of senior secondary school students is not significant at 0.05 level leading to the inference that self-regulated learning, type of school and gender do not have interaction effect on academic achievement of senior secondary school students. Therefore, the null hypothesis H_{03}, "There exists no significant interaction effect of self-regulated learning, type of school, and gender on academic achievement of senior secondary school students," is accepted.

Discussion of the Results

The present study was conducted to study the academic achievement of senior secondary school students in relation to self-regulated learning and demographic variables (type of school and gender). The findings of the present study are in consonance or contrast with the findings of following studies in the area. The results of the study highlighted that self-regulated learning has a significant effect on academic achievement of senior secondary school students. The present finding is in consonance with the findings of Kosnin (2007), Matuga (2009) , Mutua (2010) Tavakolizadeh and Ebrahimi-Qavam (2011) who also found that the students who had high scores on self-regulated learning had overall high academic achievement score and the students who had low scores on self-regulated learning were found to be low academic achievers. In the present study, it was found that senior secondary school students with high self-regulated learning have more academic achievement as compared to their counterparts. The reason for the difference between academic achievement scores of senior secondary school students with different level of self-regulated learning can be that more the level of self-regulated learning, more he/she is able to monitor, control, evaluate and modify his/her learning, which enables them to maximise their academic achievement.

The present study also established that there exists significant effect of type of school on the academic achievement of senior secondary school students. The present finding is in consonance with the finding of Singh (2014) who found that there exists significant difference between government and private students with regard to their academic achievement. It was further found that private senior secondary school students have academic achievement higher than their counterparts. This finding is also in agreement with the finding of Olatoye (2009) who also found that private school students performed better than their counterparts.

It was found that there exists significant effect of gender on academic achievement of senior secondary school students. This result is in consonance with the result of Powell (2004), Chaturvedi (2009) and Reddy and Reddy (2016) who also found that significant gender difference exists in the academic achievement of school students. It was found that the mean academic achievement scores of female senior secondary school students are higher than male senior secondary school students. The present finding is in agreement with the findings of Karthigeyan and Nirmala (2012) and Hanafi and Noor (2016) who also concluded that academic achievement of the female students is better as compared to male students. Significant interaction effect of self-regulated learning and type of school and type of school and gender on academic achievement of senior secondary school students was found. It is generally seen that female students pay more attention to their studies and also students with more self-regulated learning exhibit high academic achievement. Many researchers have also reported the significant effect of type of school on the academic achievement of the students. This may be the reason for having significant interaction effect of self-regulated learning and type of school and type of school and gender on the academic achievement of the students.

Conclusion

Self-regulation is conceptualised as a process whereby students actively construct their own knowledge and skills; and manage their own learning. In the present study, self-regulated learning was found to be one of the most important factors influencing learning and academic success of the students. Thus, in order to promote self-regulated learning among students, self-regulated learning instructional strategies can be integrated within the curriculum. To educate teachers about the use of self-regulated learning instructional strategies, conferences/ seminars/ workshops can be organised regularly so that they may be able to develop this among students. As the academic achievement of female school students was found higher than male school students and significant interaction effect of self-regulated

learning and type of school was also found, so guidance and counselling services may be arranged specially for male students to enhance their self-regulated learning and academic achievement.

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Plagiarism in Education Programmes

Legitimised Dishonesty or Lack of Awareness?

HEMA RAMACHANDRAN*, DIVYA SINHA** AND MEDHA S. RAJADHYAKSHA***

Abstract

Data and literature available due to technological advancements in computation and Internet connectivity has encouraged plagiarism among undergraduate and postgraduate students. We addressed the question whether this is because of lack of awareness about plagiarism and its serious consequences amongst students and teachers or whether plagiarism is permitted as a soft crime. We conducted a survey amongst students and teachers using the questionnaire method. The major questions were related to whether the student/faculty was informed about plagiarism, and whether they know that plagiarism is a serious misconduct. Questions also assessed whether the subjects recognised plagiarism and knew about 'referencing'. On the basis of our study, we suggest that there is lack of awareness in students about the various aspects of plagiarism and there is a feeling in the academic community that plagiarism is somewhat permitted. We propose some ways to correct the situation and ensure development of skills for original writing.

INTRODUCTION

The undergraduate and postgraduate students of most of the Indian Universities have to submit lab record book, assignments in various forms (write-ups, posters, descriptive text), literature surveys (review of a given topic in detail) and/or thesis (a detailed write-up of experimental work carried by them). Most of these activities are mandatory and are supposed to be carefully evaluated and graded. The ultimate grade given to the students is dependent

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on the quality of submissions made. At best, all these activities require originality, creativity and expression skills. Leaving laboratory journals as a means for facilitating or of assessing learning, the very purpose of including these activities in the curricula is to nurture novel thought processes, writing skills and documentation. This also encourages students to develop professional attitude in the field of their choice. However, this can only happen if all these activities are done with a spirit of learning and with ethical responsibility. Any misconduct in this area can be extremely damaging not only to the individual but also to the community at large. Today, one of the major challenges faced by educationists in the country is a very specific misconduct, plagiarism, which is rampant and damaging at all levels in professional life (Satyanarayana, 2010). The advances in in-silico technologies have aggravated the problem because of ease with which this can be done. A 'copy-paste' job has never been simpler and more tempting! The problem of plagiarism is global; however, it appears to be plaguing the Indian academia far more as not many educational institutions have paid adequate attention to the malice (Chaurasia, 2016).

As it goes unpunished in any form, most of the time, it appears to have gained some legitimacy and acceptance in classrooms. Apathy to address the problem is so serious that often the students are never informed clearly about the inappropriateness of plagiarising. We hypothesised that plagiarism seen in undergraduate and postgraduate programmes is because of lack of information and not because of poor work ethics of students. This hypothesis was tested by conducting a survey amongst our own students and faculty.

Methods

The survey was conducted by using the questionnaire method (See Appendix). The subjects that participated in this research study included Junior College students (12th Standard), Undergraduates and Postgraduate science students with various specialisations (life sciences, microbiology, chemistry) and members of the Science Faculty at Sophia College. A total of 308 students were administered the questionnaire.

The questionnaire was divided into four parts (Section I to IV). Section I had personal information; Section II investigated whether the students and the faculty were aware of plagiarism and was adopted from a questionnaire already used (www.danielcraig.com/illinois/eslclasses/esl401spr00/…/questionnaire.doc). Section III asked questions regarding whether different forms of plagiarism could be identified as misconduct and whether the students knew about how references are written. Section IV investigated whether students and faculty considered plagiarism as a serious offence which deserved to be punished. Questions of Sections III and IV were adopted

from the survey questionnaire by Marietta Bardinova.

Results

The results were calculated by coding 'Yes' as 1 and 'No' as 0; the percentage of positive response was calculated as in percentage of the total sample size. The consolidated results are depicted in Table 1.

Table 1: Percentage of positive responses

Section	Faculty	PG	UG	JC
Section II				
1	92	92	43	22
2	54	58	35	7
3	54	75	52	40
4	71	92	80	57
Section III				
1	75	75	68	52
2	58	67	36	34
3	46	0	39	32
4	58	58	37	32
5	79	67	58	61
6	79	50	56	51
7	96	67	66	53
8	92	67	56	50
9	75	58	38	29
10	75	50	42	33
Section IV				
1	79	92	84	80
2	92	75	60	52
3	54	75	62	58
4	46	42	53	57
Section V				
1	88	67	87	84

Graphs were generated to provide details of the results specific to sections and are given in Figure 1. The question number is as it appeared in the questionnaire and the proportion of students/faculty answering positively (Yes) to the question have been plotted against each group.

This data (Fig. 1) suggests that in junior college and in undergraduate classes, 60 per cent or more students had not heard about plagiarism nor had been instructed by the teachers about it as misconduct.

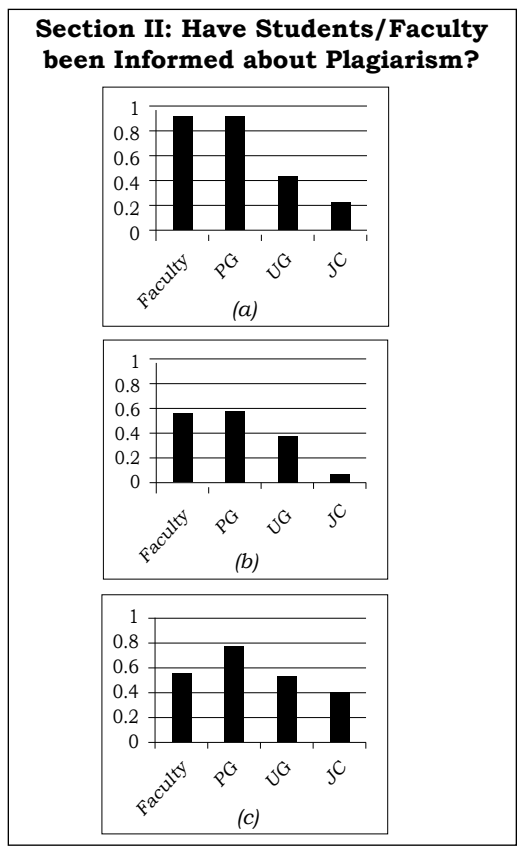

Figure 1. Graph depicting answers to Section II (Appendix)

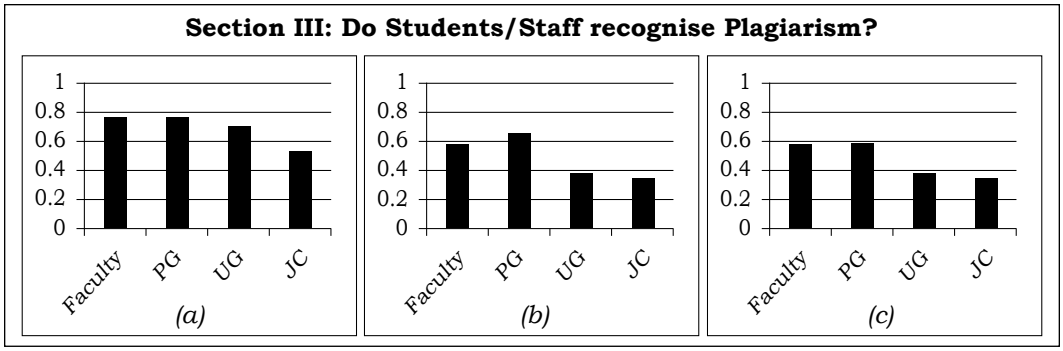

Figure 2. Graph depicting answers to Section III (Appendix)

This data suggests that though 50 per cent or more students know that it is wrong to use somebody else's work, 60 per cent of UG and JC students are not aware of various forms of plagiarism.

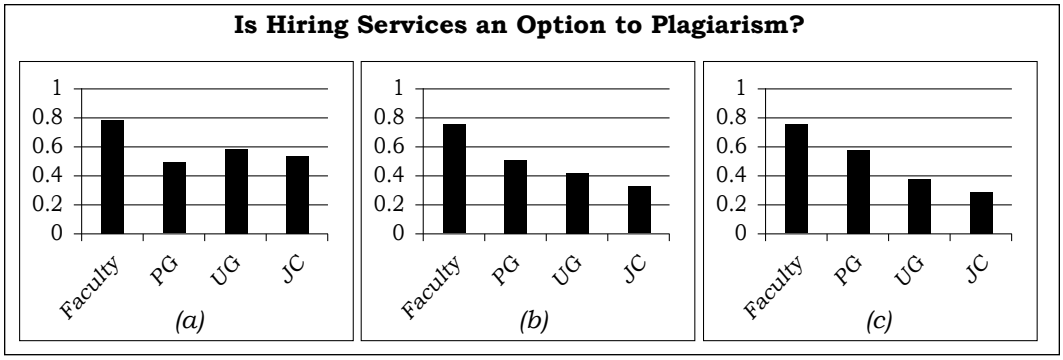

Figure 3. Graph depicting answers to Section III (Appendix)

The data indicates that majority (>60%) know that hiring help is misconduct.

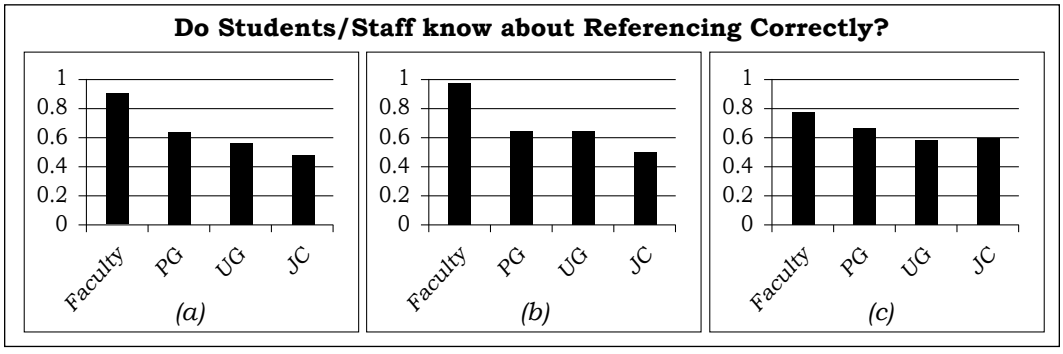

Figure 4. Graph depicting answers to Section III (Appendix)

Most students do not seem to know that footnotes or quotation marks are important.

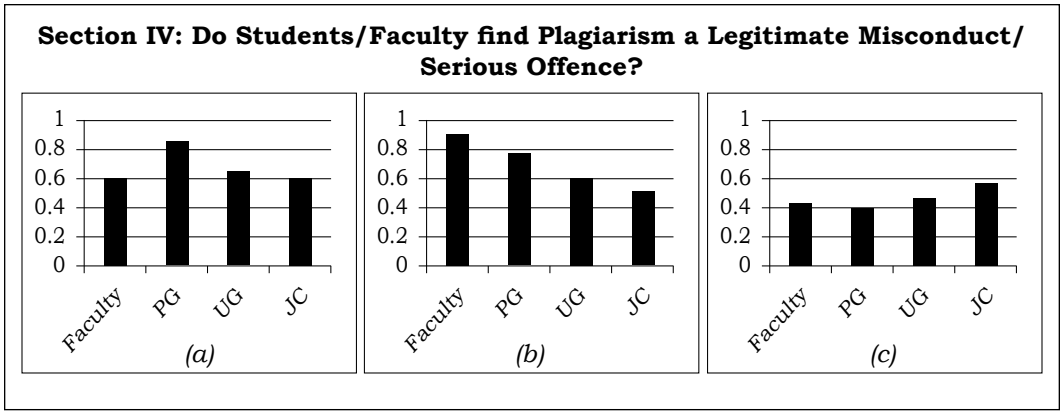

Figure 5. Graph depicting answers to Section IV (Appendix)

Most students feel that plagiarism is wrong and should be punished, however not severely.

Discussion and Conclusion

Plagiarism is defined as reproducing another person's work as one's own work. It is a serious and mounting form of academic misconduct reported from all spheres of academic communities. While the dictionary definition of plagiarism is simply put as—to take and use another person's thoughts, writings, inventions as your own—it takes forms that are often, not clearly recognised by the offender. Students often argue that all information available to date is essentially not generated by them and it is impractical to acknowledge every idea or work specifically. There is clearly haziness about what should be definitely acknowledged and what is freely available. Among students of all nationalities, particularly Asian students with poor language skills, this has become a contributing factor. Indian students have been notorious for their behaviour in this regard (Venugopal, 2010). The malice of plagiarism in Indian science has reached unprecedented dimension with scientists from reputed institutions implied in the misconduct (Anon., 2007; Anon., 2010; Pandey, 2016; Tewari, 2008). Though written about (Balaram, 2005; Mahadevan, 2008; Rao, 2008) and discussed amply, it has not resulted in universal guidelines to be adopted by educational institutions. While it is amply enforced that the way to tackle the problem is to address the root (Satyanarayana, 2010), the educational system—the method of teaching, examinations and evaluation—little is done at the classroom level to just stop the menace. There is no doubt that the ultimate solution lies in a complete overhauling of the way we teach and learn, there is a lot that can be done within the existing framework. General interactions with the

students at various levels suggested to us, that our students have never been clearly taught about what is right and wrong in copying of various forms. To ensure ethical practice by academics and students as well as to create awareness we conducted a survey among our college science students and faculty.

Results of our survey suggest that lack of awareness about misconduct in scientific writing could be a major cause of plagiarism. As recently pointed out very eloquently in a comment in the prestigious journal *Nature* (Chaurasia, 2016), in India, confirming strictly to text is taught very early in school. This subconscious 'copy-pasting' from books to examination papers strongly settles in higher secondary and, in fact, is highly valued by examiners. Students and perhaps teachers as well find it legitimate to borrow words in totality from others. Plagiarism is a non-issue at this stage and if pointed out, is considered a minor offence. Students who enter university education system are skilled users of Internet—plagiarism seems to be an academic way of life. There is no system in place to catch offenders nor is there a code of conduct defined by most educational institutions. Teachers, while instructing repeatedly not to 'copy-paste', have little time and inclination to ensure that every assignment/literature survey submitted is not a result of some form of plagiarism. The reason partly is also lack of knowledge about various types of misconduct that comprise plagiarism. Reproducing resources from thesis or assignments done by their older peers is not considered as a serious offence. In case offender is clearly caught, the education system has no legal resort and it is easier to let go with severe warning or mild punishment such as re-writing the document with corrections. Our data provides evidences for this conclusion.

The present study also demonstrates that students are not aware about referencing. This is a deep-set problem which is at best ignored. No footnote in journal work, incomplete references, Power Points that are often downloaded from the Internet and absence of bibliography during documentation are order of the day in most classrooms. No clear data ha been collected to indicate how widespread the malice is, though personal communication and observation suggests that it is all pervasive in undergraduate programmes. As per our study, there is improvement in postgraduate programmes Specially, there appears to be more awareness and compliance to the instructions given. However, clearly these changes are not universal and sufficient to ensure that this misconduct would be completely rectified by the time students enter formal professional life as scientists, as there are several reported instances of senior,reputed scientists plagiarising. The situation clearly requires a solution which is urgent and cannot wait for total reform of the present system. We

suggest the following especially for Junior college, undergraduate and postgraduate programmes.

Firstly, lab-note work should be made into an exercise which specifically encourages original writing. No printed journal should be provided. The journal should be a log of what is done in the laboratory. In case it is necessary to provide some protocols, a short, minimal manual with references should be provided. The journal should have a simple section of 'What I did in the lab today', which cannot be plagiarised. The marks allotted to the journal should be given on examination of one practical written in their own language (which the student should be free to indicate).

Secondly, within the framework of syllabus, writing of long answers/ descriptive paragraphs and/or short essays should be given as assignments. The questions/topics given should be so proximal that there is no information available on the Internet. For example, describing an experiment demonstrated by seniors/teacher, an animal behaviour observed on the campus, review of a movie clip (on topic which is part of the syllabus) in class or a personal review of what was taught in class that day. This exercise could be done during every lab work and at the end of every class for ten minutes. Pushing students to write at least ten original sentences every day is likely to improve their language skills and build confidence. Once in a while this exercise may be evaluated and rewarded. Students with poor language skills should not be penalised but adequate time be given to improve their ability to express their ideas. Young adults often respond to criticism by switching off and this can be avoided. With better language skills plagiarism is likely to be curbed, especially as students learn to enjoy their own writings!

Thirdly, concrete steps need to be taken to spread awareness about plagiarism. A minimum of two workshops, even if repetitive, can be conducted for students. Master peer group instructing undergraduate students might go a long way in making these workshops effective. Library or spaces where students are likely to work should have charts about referencing from various resources. Lab reports should also carry a clear instruction on types of plagiarism and about how to cite resources.

Lastly, a strong local code of conduct should be evolved and communicated. It can be emphasised that plagiarism is as serious an offence as cheating in a formal examination and can be punished with the same severity.

The present study is limited by numbers participating in the survey and has a strong gender bias as it was conducted in the college which is essentially for women. The questionnaire too has a mild bias towards positive answers. Despite these limitations, the survey provides insight

into how an academic misconduct settles into student community and is perpetuated thereafter. Our suggestions on improving the situation deserve attention, specially, as they are doable in any classroom. There is no doubt that the education system requires a completely new vision, however, the problem of plagiarism cannot wait till that happens and needs immediate attention.

Therefore, incorporating a learning module in academic writing, development of critical reading pattern can change poor study habits and distinctly improve scientific communication skills. Also, inculcating ethical study practice with access to web-service tools can prevent plagiarism. There is a serious need for statutory controls as well as a national level awareness to be implemented by national level bodies for higher education.

Appendix

Questionnaire

An overview of the formalities of questions, demography of subjects and total number is given below.

Section I

- **Demographic questions included** (Age, gender, subject and position)

Section II

- **Have students/faculty been informed about plagiarism?**
  Have you heard about Plagiarism earlier? (Yes/No)
  Was plagiarism ever mentioned or explained to you at school/college? (Yes/No)

- **Has plagiarism been explicitly pointed out?**
  How often did any of your teachers in the past ever tell you (i.e., by means of spoken or written comments) that you have made this kind of mistake in your own written work?

- **Do students/staff consider plagiarism wrong instinctively?**
  In your own opinion, to what extent do you feel you yourself copied the words or ideas of other writers without indicating the source in your writing assignment for school? Please, answer this question without considering whether or not you understood what might be wrong with such a habit.

Section III

- **Do students/staff recognise plagiarism?**

  Reading someone else's term paper and then writing your own using some of his ideas and then copying part or all of his bibliography. (Yes/No)

  Writing a report as a group and then each person writing a report that is a little bit different to hand in. (Yes/No)

- **Do students/staff recognise self-plagiarism?**

  Taking a report or term paper you wrote for one class and rewriting it for another class. (Yes/No)

  Taking a report or a term paper you wrote for one class and handing it for another class without re-writing. (Yes/No)

- **Do students/staff know about 'referencing'?**

  Listing books in your bibliography that you have never read. (Yes/No)

  Copying sentences or paragraphs from the encyclopedia for your report without using quotation marks or footnotes. (Yes/No)

- **Do students/staff know about referring from Internet correctly?**

  Copying a report or term paper from the Internet and editing it to be 'yours'. (Yes/No)

  Copying report or term paper from the Internet and handing it in without any changes. (Yes/No)

- **Is hiring services an option to plagiarism?**

  Hiring a tutor to rewrite your papers for you. (Yes/No)

  Paying another person, or an editing service, to write your term paper. (Yes/No)

Section IV

- **Do students/faculty find plagiarism a legitimate misconduct?**

  I don't think plagiarism is right, but there are still some situations in which a student might be forced to plagiarise in order to get a decent grade in a course. (Yes/No)

  Plagiarism is always wrong, regardless of circumstances. Do students/ facutly find plagiarism a serious offence? (Yes/No)

- **Do students/faculty find plagiarism a serious offence?**

  If I discovered that a student had plagiarised, I would punish him or her. (Yes/No)

  If a student in this class got caught plagiarising a paper, he or she would deserve to fail the course. (Yes/No)

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School Participation of the Tribal
Insights from Sonebhadra

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Abstract

School participation could be considered as part of a growing democratic process, however, these processes have remained restricted to many marginalised communities. Tribal people have been the least beneficiaries during the past years. Research studies time and again have pointed out various reasons for their backwardness but policies could not work on these lines to overcome these. The present paper, while taking the specific example from Sonebhadra district in Uttar Pradesh, has addressed the school participation of the tribal children. The paper argues that in spite of hurdles the tribal could make their way towards elementary education, while their presence is very meagre at the secondary level. It also points to the fact that school participation has shown contextual variation which could be seen in the form of participation variation in different blocks of the same district. This calls for an untraditional approach to examine the issue of their school participation which has been addressed until now within a paradigm of socio-cultural and scholastic factors.

Introduction

The tribal population is identified as the aboriginal inhabitants of our country. They are present in almost every State of India. Tribal population constitutes a significant number (8.6 per cent), as per the Census of India (2011), to the total population of the country. Tribal people are commonly known as 'indigenous people'. They have been living a simple life based on the natural environment and have developed cultural patterns congenial to their basic physical and social environment. The term 'tribe' has not been defined clearly anywhere

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in the Indian Constitution. Only the term 'Scheduled Tribe' is explained as the tribal communities or parts of or group within tribal communities. These groups are presumed to form the oldest ethnological sector of the people. Tribes are 'Adivasi' or original dwellers, living in the sub-continent from unrecorded time and possibly were driven into forest by more aggressive settlers—Aryans being the earliest one to resist complete domination. Tribes evolved their distinct identity through endogamy, their cropping pattern, hunting and gathering. Above all, in their intensely personal relationship with the forest around them, they formed perfectly balanced rhythms which can be described as symbiotic. Most of the tribal are living a secluded life, untouched from the development of the modern world, usually characterised by poverty, subsistence economy and general backwardness. For centuries, they have lived their own secluded and traditional life in isolated and sparsely populated hilly regions and forest areas.

Even today, most of them are geographically isolated, economically weak, socially ignorant, uneducated and politically indifferent. Educationally the tribal population is at different levels of development and the formal education has reached very slowly and steadily to these communities. Though there exist some variations across the tribal communities in India in terms of their educational development, but on an average their performance is very poor on identified educational indicators. Earlier, the Union government had no direct programme for tribal education, but in the subsequent years, tribal educational development constituted an integral part of the development agenda. For example, National Policy on Education (1986) gave a number of recommendations specific to the tribal people. Such recommendations for tribal areas give mandate to the State governments for opening new primary schools; need to develop curriculum and instructions material in the tribal language; establish Ashram schools/ residential schools in the tribal areas; incentives for tribal, etc. (Sujatha, n.d.). It is hard to accept that in spite of various educational programmes launched for tribal, the magnitude of the problem is still alarming. Figures from NSS (National Sample Survey) show that around 4.20 per cent of tribal children are out of school followed by SCs (3.24 per cent), OBCs (3.07 per cent) and others (1.87 per cent) at the all India level.[1] Similarly, there is a huge difference in the average drop out rate of tribal children and 'Other Categories'. Educational statistics of MHRD, 2013–14, show that around 48.2 per cent of tribal children drop out before completing their elementary education, whereas

[1] National Sample Survey of estimation of out-of-school children in the age 6–13 in India: A National Survey on estimation of out of school children, 2014.

the figure for SC children is 38.8 per cent.

Various educational schemes have been introduced by the Government of India, such as Integrated Tribal Development Agency (ITDA), etc., which help in improving the quality of tribal education by providing them easy access to schools and other facilities as well (Sujatha, 1999, p. 28). In this regard, "after independence, policies have been revised several times in order to make education relevant for tribal children. Several print materials (though of doubtful quality) were developed by the State Councils of Educational Research and Training (SCERTs) and Tribal Research Institutes (TRIs) in the tribal languages for primary classes, which were used only occasionally as supplementary readers in the schools" (Panda, 2006, p. 117). In spite of these special schemes and programmes, Scheduled Tribes are unable to cope up with other castes and are still the most disadvantaged social group of India.

School Participation—A Baffling Issue

Educational status of the tribal children has improved marginally over the years, however, there seem to be various bottlenecks hindering their further educational mobility. Relatively tribal participation at the primary level has shown improvement but their participation at the secondary level is still a major issue of concern. Various data sources do confirm their low participation at the secondary level in comparison to other social groups. "Uttar Pradesh did not show much concern in providing access to secondary education for the disadvantaged groups which typically characterises the backwardness. It is surprising that despite Dalit (SC) political party called BSP being in power in Uttar Pradesh, there has been no improvement in access conditions for SC/ST population. However the State with higher socio-economic development standard had better access for SC and ST communities for secondary schools, within the habitation, than backward State with higher concentration of SC and ST population" (Mohanty, 2012, p. 65).

Research studies have pointed out various socio-cultural reasons for the educational underdevelopment of the tribal, which include lackadaisical attitude towards formal education, cultural backwardness, superstitions and myths, etc., abstaining them from formal schooling. Sujatha (n.d.) has identified three sets of indicators that lead to deprived educational quality, those are external constraint, internal constraint and socio-economic and cultural background of tribals and psychological problems of first generation learners (here, external factors include policy, planning, implementation, administration, etc., and internal factors are schools system, content, curriculum, medium of instruction, pedagogy, academic supervision, monitoring,

teacher-related problems, etc.)[2] (Ibid., p. 92). However, "the number of out-of-school children continues to be several millions, mainly due to a lack of interest and parental motivation, inability to understand the medium of instruction (i.e., state language), teacher absenteeism and attitude, opportunity cost of time spent in school (particularly for girls), large seasonal migration, etc." (Bagai and Nundy, 2009, p. 5). Besides this, some other reasons which also cause dropout or less participation in education of tribal community include language of instruction, curriculum content (methods and material that allow for local adaption), teacher training and pedagogy, community participation and ownership, incentive, etc., which are considered as internal problems, along with this some external problems which include gender bias, access, migration, etc. (Ibid.).

Sahu (2014) has identified some issues related to the tribal education which include medium of language, location of the village, economy, parents' attitude, teacher-related problems, lack of monitoring, etc. She has also suggested some important steps towards tribal education such as literacy campaign, relevant study material in the language, appointment of local teachers and female teachers, stipends and various scholarship, residential schools, social security and proper monitoring, etc. (Sahu, 2014, p. 51). Besides this, even in the present time in some places tribals were identified with pre-literacy stage due to their isolated habitation, poor economic conditions and distinct cultural practices (Vidyarthi, 1972 , p. 89). While analysing the poor response of tribal children to formal schooling, scholars tend to emphasise the economic marginalisation of these communities, their illiterate home environments, inadequate facilities for education and, culture, the alien nature of the school system. While these factors are no doubt important to explain the response of tribal communities towards the education of their children, it becomes essential to focus on school processes as well. 'This is necessary given the magnitude of drop-out (and possible stagnation) of children within a year of joining primary school' (Nambissan, 1994, p. 2747). In other words, sometimes a language which is dominating in a place has been used in the schools which generate many persons who are illiterate in their mother tongue, in this way tribals are often compelled to leave their mother tongue and adapt the dominating language to have school education (Pattanayak, 1981). Some successful learning strategies such as folk practice, which has been used by tribal children, have often been devalued or not recognised by non-tribal teachers. Sometimes even children are discouraged to practice those strategies within the classroom (Panda, 2006, p. 117).

[2] http://www.doccentre.net/docsweb/Education/Scanned_material/analysis_Tribals.pdf

However, some steps which can help in developing the quality of tribal education have been identified by Rao (2009), which include accessibility of locally relevant material so that children can develop a sense of affiliation to school, joint venture between community and government, suitable and sustainable environment building, decentralisation of education management, skill development, capacity building and teachers' motivation, etc.[3] Along with this, encouraging tribal parents to participate in school-related activities by creating awareness among them also lead to improved value education among tribal community (Rao, 2009, p.64). Even though "by giving a special impetus to education programs, which will ensure universal enrollment for primary education and provide access to tribal children to pursue higher studies in the urban areas, the socio-economic gap between tribal population and the general population can be bridged effectively" (Jagannath, 2009, p. 2).

In context of the above-placed arguments, one can place many assumptions to understand the educational backwardness of the tribal people. Even though the contextual variations are marked with particularities which may not be generalised but tribal problem can be understood through the socio-cultural theories of educational backwardness. While accepting the socio-cultural reasons, few more often talked reasons are the medium of language in the school curriculum, remote location of the tribal villages making schools less accessible, poverty, teacher absenteeism, poor school infrastructure, poor coordination between tribal welfare development and school education department, etc., could be some of the possible factors which provide an explanation beyond cultural theory. The issue of educational planning and policy certainly assumes importance to address these problems.

Trailing Secondary Participation

Sonebhadra district is the second largest district of Uttar Pradesh, which has been carved out from Mirzapur district in 1989. It is a district with huge chunk of indigenous tribal population and has Mirzapur district in the north-west, Chandoli district in the north, Bihar in the north-east, Jharkhand in the east, Chhattisgarh in the south and Madhya Pradesh in the west. The district consists of eight blocks named as Ghorawal, Chopan, Robertsganj, Chatra, Nagwa, Myorpur, Duddhi and Babhani. As per the Census of India 2011, the total population of Sonebhadra is 18.6 lakh (52 per cent male and 48 per cent female population). Besides this, 83 per cent of the total population of the district resides in rural area and rest (17 per cent) is urban population. The average literacy rate of Sonebhadra is 64

[3] http://www.doccentre.net/docsweb/Education/Scanned_material/analysis_Tribals.pdf

per cent (Census 2011) constituting 75 per cent male and 52 per cent female literacy rate. In spite of the rural characteristics, the district of Sonebhadra surprisingly shows high work participation rate (39 per cent) than the state average (33 per cent). It may precisely be the inability of the poor households to remain unemployed and earn livelihood from whatever means are available.

It could be seen from the Census of India, 2011 that the total population share of tribal in Sonebhadra is higher than the State level. The worst sufferers are the indigenous tribal communities. The district of Sonebhadra is inhabited by various tribal communities, namely Gond, Bhuia, Chero, Kols, etc. These communities together constitute around 21 per cent of the total population of the Sonebhadra district. Sonebhadra is the only district of the State with preponderant tribal population. The trends show a fall of sex ratio among the tribal population of the Sonebhadra district from 980 to 946, therefore, trailing the average sex ratio of the State, i.e., 952. The district also has poor literacy rate among tribal (44.2 per cent) than the average literacy rate of STs at the State level (55.7 per cent). The only indicator where the tribals of Sonebhadra have done relatively better is the work participation rate which is higher than the State average (see Table 1). The interface between higher work participation and school participation of tribal children needs to be probed to map their schooling. Since tribals are usually involved in labour work (Shah, 2015), therefore, it is assumed that their work participation in the labour work is the potential reason for school dropout of tribal children.

Table 1
Profile of Scheduled Tribes of Uttar Pradesh and Sonebhadra

		Uttar Pradesh	Sone-bhadra
Population	Total	11,34,273	3,85,018
	Rural	10,31,076	3,74,916
	Urban	1,03,197	10,102
	Male	5,81,083	1,97,825
	Female	5,53,190	1,87,193
Sex Ratio	2001	934	980
	2011	952	946
Literacy Rate	Total	55.7	44.2
	Male	67.1	43.7
	Female	56.2	31.4
Work Participation Rate		37	43.25
Percentage of main worker		50.63	42.79
Percentage of marginal worker		49.37	57.21

Source: Census of India, 2011

The State of Uttar Pradesh is considered to be one of the educationally backward States of India. The rich demographic dividend needs to be unleashed through the provisions of accessible quality education. The most important challenge which the State needs to address is the quality school education

to the marginalised communities inhabiting under-developed peripheries of the State. The accumulated effect of the remote geographical location, poverty and poor school provisions have resulted into abysmal state of school education among the indigenous tribal communities of the Sonebhadra district. The comparative picture places Sonebhadra tribal at the bottom of every welfare provision. All the blocks in Sonebhadra together share around 1.19 per cent of the total schools located in the State, which includes all the schools from primary to higher secondary level. Chopan block has the highest number of schools, while Babhani block has the lowest number of schools (see Table 2).

As per UDISE 2013–14, UP is one of the States with huge number of private schools. The share of private schooling at the secondary level is too high, while the presence of the State sector is very meagre. Around 69 per cent of secondary schools in UP are private unaided school, whereas the percentage share of aided and government secondary schools together is only 31 per cent (see Table 3). Though private schooling has been considered as an urban phenomenon, but its pervasiveness can be found everywhere. The marginalised children are the last to get admission into the private schools. The district scenario of Sonebhadra shows that the percentage share of ST children in the private unaided schools is very meagre. But it is surprising to see in the case of Babhani and Dudhi (two of the blocks in Sonebhadra) that the tribal share of private school enrolment at the elementary level is far better than other communities (see Table 4). It may possibly be the result of high concentration of tribal population in these blocks but more clarity requires ethnographic accounts.

Table 2
Block- and Level-wise Distribution of Schools, Sonebhadra District, 2013–14

		Primary Only	Upper Primary	Secondary	Higher Secondary	Total
Blocks	Babhani	120	43	5	2	170
	Chatra	126	53	7	7	193
	Chopan	414	150	9	13	586
	Dudhi	232	86	6	6	330
	Ghorawal	331	127	9	13	480
	Myorpur	318	149	6	22	495
	Nagwa	130	54	10	1	195
	Robertsganj	334	146	10	26	516
District	Sonebhadra	2005	808	62	90	2965
State	Uttar Pradesh	153220	73281	7682	15195	249888

Source: UDISE, 2013–14

Table 3
Management-wise Distribution of Schools, Sonebhadra District, 2013–14

		Elementary			Secondary			Higher Secondary		
		Govt Schools	Pvt. Aided	Pvt. Unaided	Govt Schools	Pvt. Aided	Pvt. Unaided	Govt. Schools	Pvt. Aided	Pvt. Unaided
Blocks	Babhani	159	0	5	4	0	3	1	0	1
	Chatra	154	1	27	1	2	11	0	2	5
	Chopan	502	2	66	6	3	13	3	3	6
	Dudhi	286	1	35	5	1	6	3	1	2
	Ghorawal	416	1	53	5	1	16	4	1	8
	Myorpur	395	3	85	5	1	22	3	1	17
	Nagwa	177	0	10	7	0	4	0	0	1
	Robertsganj	409	6	73	5	6	25	3	6	17
District	Sonebhadra	2498	14	354	38	14	100	17	14	57
State	Uttar Pradesh	160636	10325	64572	2005	4621	15048	876	3941	8715

Source: *UDISE, 2013–14*

Table 4
Caste-wise enrolment in Unaided Schools, 2013–14

Blocks	Enrolment in Unaided Schools (%)									
	Primary					Upper Primary				
	GEN	SC	ST	OBC	TOTAL	GEN	SC	ST	OBC	TOTAL
Babhani	6	16	33	45	100	2	12	58	28	100
Chatra	10	29	4	58	100	15	23	7	54	100
Chopan	10	26	10	54	100	10	23	11	56	100
Dudhi	6	17	23	54	100	9	18	22	51	100
Ghorawal	13	30	3	54	100	14	27	2	57	100
Myorpur	28	16	9	48	100	29	14	10	47	100
Nagwa	9	16	13	62	100	7	18	9	66	100
Robertsganj	20	18	3	60	100	18	18	3	62	100
Sonebhadra	16	20	10	54	100	18	19	9	54	100

Source: UDISE, 2013–14

Participation Variation— Block Scenario

It can be found from UDISE statistics that in Sonebhadra, 20 per cent of the total enrolment comprises Scheduled Tribe population, which is relatively very high from the State level average (1 per cent). Besides this, concentration of ST students is very high in Babhani and low in Ghorawal and Robertsganj blocks of the district. However, except three blocks (Chatra, Ghorawal and Robertsganj) all other blocks of the district have more than 20 per cent of Schedule Tribe enrolment (see Table 5). Reducing dropout is one of the critical issues which affect more severely the marginalised communities, thereby reproducing the culture of illiteracy and reducing the chances of occupational mobility. The government through number of initiatives has been able to increase the enrolment of marginalised children manyfold, but retaining them to complete minimum level of education is a big challenge. The data description shows that dropout of STs in Sonebhadra at the upper primary level is higher than the state level, indicating that the higher proportion of ST children are not able to enter the secondary level. It could be noted that dropout rate in Sonebhadra after the primary level onwards is very high, surpassing the average dropout rate at the State level (see Table 6).

Table 5
Caste-wise Percentage Share of Enrolment, from Classes I to XII, 2013–14

		Gen.	SC	ST	OBC	Total
Blocks	Babhani	6	12	51	32	100
	Chatra	11	29	8	52	100
	Chopan	7	23	30	40	100
	Dudhi	5	17	36	42	100
	Ghorawal	8	43	5	45	100
	Myorpur	17	18	24	41	100
	Nagwa	4	20	31	44	100
	Robertsganj	15	28	5	52	100
District	Sonebhadra	10	25	20	44	100
State	Uttar Pradesh	22	26	1	51	100

Source: UDISE, 2013–14

The massive dropout rate of the tribal children from the primary level onwards conveys many messages. First, the inability of the poor household to continue education of their child; second the possibility of the involvement of child in household/child labour; and finally the inability of the school system to help poor tribal children to overcome their cultural poverty and occupational background. One of the studies conducted by Shah (2015) shows that most of the tribal households in Sonebhadra are involved in labour work, especially the youth. A tribal household of Sonebhadra who used to till land and survived on agriculture has been forced to shift their occupation. The inept policy of the government could not help these indigenous communities to survive their traditional methods of livelihood. Therefore, the proposed research offers a possibility to explore the comprehensive nature of the household and scholastic factors which promote the dropout at the upper primary level in the selected schools, leading to the meagre participation of the tribal children at the secondary level.

Table 6
Average Annual Dropout Rate of STs, 2013–14

		Primary	**Upper Primary**	**Secondary**	**Higher Secondary**
Blocks	Babhani	10.67	23.33	49.44	9.43
	Chatra	6.77	-	15.51	-
	Chopan	11.85	21.32	-	-
	Dudhi	4.66	13.04	34.33	24.37
	Ghorawal	12.79	28.97	51.5	37.93
	Myorpur	9.9	5.44	-	12.06
	Nagwa	0.16	30.57	43.16	-
	Robertsganj	5.26	0.97	44.61	17.31
District	Sonebhadra	8.75	14.63	13.99	7.53
State	Uttar Pradesh	16.91	2.99	9.91	7.3

Source: *UDISE, 2013–14*

Conclusion

Education status of the tribal population is a serious issue of concern. They are at the margin of development and the formal education has reached very slowly and steadily to these communities. Though there exist some variations across the tribal communities in India in terms of their educational development, but on an average, their performance is very poor on identified educational indicators. Government policies have always given a special focus to the tribal people but could not do much for their benefit, like in National Education Policy (1986) number of recommendations have been mentioned. Such recommendations are: tribal areas will get priority for opening new primary schools; need to develop curriculum and instructions material in tribal language; establish Ashram schools/residential schools in tribal areas; incentives for tribal, etc. In spite of many initiatives in the form of opening Ashram schools, teaching in local language and scholarship programmes, etc., nothing substantially has improved their educational status. Tribal are still at the margins of the development programmes, especially their school participation. The paper made an attempt to examine various available factors to arrive at the conclusion. By taking a specific example from Sonebhadra, the paper arrives at two inferences: (1) the dropout rate of the tribal children at the primary level in Sonebhadra is very less than the State level and (2) the enrolment rate of tribal children at the secondary level in Sonebhadra is relatively lower than the State level. These underlying trends amply prove the fact that tribal children are very much interested in availing school education, but are unable to continue education, at the secondary level. One can also notice block-level variation in school participation within the Sonebhadra district. Some blocks have shown better enrolment status among tribal than other. This comparison defies the more generalised understanding of tribal school participation. The paper on the basis of findings urge for a more detailed ethnographic understanding of the tribal school participation which could have some contextual variation.

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Effectiveness of Smart Class on Achievement of Students in Science at the Upper Primary Level

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Abstract

The present study investigated the effectiveness of smart class on achievement of students in science at upper primary level. The sample consisted of 60 students of Class VII of a public school of Udaipur city. The school was selected purposively and students were selected randomly. An experimental method was employed in the study. A true experimental design, i.e., pre-test, post-test equivalent group design was used. A pre-test was administered before the treatment, then a treatment of 21 days was given. The experimental group was taught through smart class, whereas control group was taught through conventional method of teaching. Then a post-test (achievement test) was administered on both the groups. A t-test was used for the analysis of data. The experimental group was found having significantly higher achievement scores as compared to the control group.

INTRODUCTION

Education is dramatically changing its form and structure in order to accommodate the expanding knowledge. Everyone wants to acquire more in less time be it the students or the teachers. Students have turned more demanding and inquisitive. Curriculum has developed extensively and has given a way to the contemporary approaches to teaching and learning. To add upon the knowledge revolution is the development in information technology which has also contributed to education technology. These changes have further revolutionised our classroom, thus impacting what we teach and how we teach.

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The new revolutionary programme in school education system 'Smart Class' has changed the concept of learning. It is an innovative technology that has aimed to revolutionise the way teachers teach and students learn in Class. Smart Class uses all interactive modules like videos and presentation and these visually attractive methods of teaching appeal to students who are already struggling with the traditional method of teaching in classroom. The curriculum is converted into animated visuals, which not only becomes an enjoyable experience for students but they can also relate to and remember facts easily.

For them, while learning in the classroom becomes a thrilling and existing experience, in the end they find abstract and difficult concepts easy to comprehend, thereby enhancing the academic performance. Such teaching helps to maintain the students' interest and focus by engaging them fully in the entire learning experience.

Features of a Smart Class

A smart class is a class that has an instructor equipped with audio-visual equipment, allowing the instructor to teach using a wide variety of media. These include smart interactive white boards, DVDs, PPTs and more, all displayed through a projector. Smart class includes smart learning techniques, smart classroom management, smart learning environment and smart learning material. Internet, projector and multimedia devices are the main parts of a smart class.

The actual smart classroom system consists of five main components.

a. ***Video Projector System***: Includes a ceiling mounted projector and a large projection screen in the front of the classroom.
b. ***Audio System***: Includes a specified number of 2' × 2' speakers that are designed to replace the ceiling tiles, which allows for quality sound without invasive speakers taking up valuable space.
c. ***Control***: A smart board is the heart of the control system which operates the components of the system.
d. ***Video Camera/Visualiser***: It is similar to an old style overhead projector, except that the teacher does not have to use transparency papers only, but can also use any paper or project a three-dimensional object onto the screen, if required.
e. ***Smart Class Software***: It is tailored to the specific needs of the students.

In addition, each classroom is equipped with a VCR, DVD, microphone, wall phone, wireless radio frequency mouse and keyboard, a permanently mounted PC and a laptop port—all key pieces that complete the system.

Smart class has a unique delivery model for schools. A knowledge centre (server room) is created inside

the school equipped with entire library and smart digital content. The knowledge centre is connected to classroom through Internet. Teachers get relevant digital resources such as animation and videos, interactive virtual lab tools, etc., and use them as a part of their lesson plans in every classroom period. The classrooms are equipped with custom designed electronic interactive white board (smart board), a projection system, PCs and a visualiser to present teacher's own notes and also any object. Smart class is powered by a vast repository of digital instruction material exactly mapped to meet the specific objectives laid out by different stages of learning standards.

The content repository consists of thousands of highly animated lesson-specific 3D and 2D multimedia modules. These are built with an instructor-led designs that allow the teachers to effectively transact the lesson in a classroom. The modules help the students to understand the concepts easily. Teaching-learning process becomes joyful and useful. The modules are embedded in a template that allow the teacher to teach a selected lesson in a class, frame by frame,with enjoyable and instructionally sound animated sets of visuals. The curriculum reach unfolds from kindergarten to Class 12 covering subjects like Mathematics, Science, English, EVS, Social Science, Physics, Chemistry, Biology, History, Geography, Economics, Civics, Business Studies, etc.

Science is the subject in which almost all the topics (especially in Biology) need lots of visualisation to develop the concepts and understanding. Researcher believes that in order to cater this need of visualisation, the smart classes are the most appropriate way. As far as upper primary level is concerned, it is the level which helps in forming introductory concept of any subject for higher classes. It is necessary to make Science interesting, meaningful and applicable. Thus, clear understanding of any topic in the syllabus is quite necessary at this level, otherwise it may lead to conclusion and burden at higher stages in education. In this regard, smart classes also provide the facility to scale up environment and to visualise abstract concepts. The question is, how does smart class affect the achievement of students at this level.

Objectives

- To study the effectiveness of smart class on achievement of students in Science.
- To compare the result of students' studies through smart class and conventional class.

Hypotheses of the Study

(i) There is no significant difference between pre-test mean scores of achievement of students of experimental and control group.

(ii) There is no significant difference between post-test mean scores of achievement of students of experimental and control group.

Operational Definitions

(i) Smart Class

Smart Class is a class that includes smart learning techniques, smart classroom management, smart learning environment, smart class software, etc. Internet, projector, smart board, a visualiser and other multimedia devices are main parts of a smart class. Teachers get relevant digital resources and use them as part of their lesson plan in every classroom period. The content is in the form of 3D and 2D multimedia modules. These are embedded in a template to teach a chosen lesson in class, frame by frame.

(ii) Conventional Class

It is a regular classroom which keeps the teacher in the centre and uses lecture method for teaching the students. Teaching aids such as charts, maps, models, etc., are used.

(iii) Achievement

It generally refers to how well a student is accomplishing his or her tasks and studies.

For the purpose of the study, achievement is defined in terms of the marks obtained by students in Science in the achievement test constructed by the researcher.

Variables

(i) **Independent variable**: Teaching method was taken as independent variable and it had two levels, i.e., smart class method and conventional class method.

(ii) **Dependent variable**: Achievement of students in science test was taken as the dependent variable.

(iii) **Controlled variable**: Subject, content and teaching time were selected as controlled variables.

Area and Type of Research

The study deals with educational technology because of the use of smart class. The research could be considered as behavioural research because its result can be applied in day-to-day life.

Design of Research

The study measures the effectiveness of the two types of classes in which teaching was required, therefore it was undertaken through experimental method. A true experimental design, i.e., pre-test post-test equivalent group design was selected.

Delimitations

(i) One English medium public school of Udaipur city was taken for the study.

(ii) Only 60 students of Class VII were included in the study.

(iii) The study was delimited to topics of Biology.

Sample

The school was selected purposively where smart class was available. Sixty students of Class VII of a public school of Udaipur city were selected randomly. A section of Class VII (out

of four sections) was selected through lottery system. An achievement test was administered on all the students of the selected section. The students were arranged in descending order of marks obtained by them in the achievement test. Then they were selected one by one in both groups randomly to form two equivalent groups, i.e., experimental and control group.

Procedure

Teaching programme for the smart class and conventional class were prepared by the researcher which included the selection of content, timetable and lesson plans as per period. The nature and requirement for the two classes were kept in mind while preparing these programmes.

A pre-test (achievement test) was administered before the treatment. Then a treatment of 21 days was given. The experimental group was taught through smart class and control group through conventional method. After treatment, a post-test (achievement test) was administered for collection of data.

Tools

(i) Computer software—Educomp Smart Class Solution (K-12).

(ii) An achievement test in science constructed by researcher.

Analysis and Interpretation of Data

(i) The difference between pre-test scores of the students of experimental and control group

As shown in Table 1, the t-value of pre-test scores of students of experimental and control group is statistically not significant. Thus, it may be said that both the groups were academically equal or homogenous in nature before the experimental treatment was given.

Table 1

Group	N	Mean	S.D.	Mean Difference	t-value	p-value	Significant/ Not significant
Experimental group	30	18.10	4.286	0.33	0.31	0.974	*Not significant*
Control group	30	18.07	3.991				

(ii) The difference between post-test scores of students of experimental and control group

Table 2

Group	N	Mean	S.D.	Mean Difference	t-value	p-value	Significant/ Not significant
Experimental group	30	40.10	6.255	4.900	2.783	0.007	Significant at 0.01 level
Control group	30	35.20	7.341				

As shown in Table 2, the t-value between the post-test score of students of experimental and control group is statistically significant. Thus, it may be said that this difference may be due to the experimental treatment given to the experimental group through smart class.

Discussion

In the present study, the post-test scores showed that experimental group performed better in comparison to control group. It reveals that teaching through smart class is more effective for students in gaining achievement in science in comparison to the conventional method of teaching. It may be due to that in smart class the content was presented before the students in the form of multimedia modules in proper sequence. It includes videos, pictures, presentations, etc. We know that science is a subject in which almost all the topics, specially related to biology (organ systems, habitats of organisms, etc.), need visualisation. Sometimes students cannot understand the difficult concepts when taught in abstract form in conventional class, but when they visualise that content on smart board in an interesting way, it becomes joyful for them and helpful in better understanding of the concepts and this may result in better performance due to conceptual clarifications. So, smart classes may be useful for all types of students for better understanding of the concepts thereby enhancing the achievement level.

Conclusion

The findings revealed that Smart Class is effective in enhancing achievement of students in Science at upper primary level, so teachers of Science as well as other subjects may utilise Smart Class as a part of teaching-learning process in order to improve achievement of students. The government and private schools may make available the basic infrastructure and other facilities required for teaching-learning through Smart Class. The administrators need to work proactively to ensure smart classroom

facilities in schools. During pre-service teacher preparation as well as continuing teacher development programmes, teachers need to get exposure to use smart classroom effectively, for that teacher education curriculum may include use of smart classroom in teaching/learning and development of software packages for the use in classroom.

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Learning to Create a Blend through Podcasts

A Case Study

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Abstract

Learning through technology is a gateway to acquisition and processing of information. A plethora of digital technologies, including podcasts can make learning interesting, enriching and efficient, thereby adding a blend and taste to learning. As teachers are crucial partners in the learning process, they need to be equipped with a variety of digital skills to create digital learning material such as podcasts. The paper focuses on enabling student-teachers to understand the dynamics of podcasts, create them, measure their attitude towards the developed podcasts and also their reaction to use of podcasts in learning.

INTRODUCTION

Innovations in digital technology through the years have brought in new opportunities not only for the general public, but for education too. Particularly, the younger generation has witnessed a plethora of technological devices, such as smart phones and other hand-held devices, as well as computers during the later part of the first decade and within the second decade of this century.

Keeping in mind that the 21st century learner is a 'digital native' in the words of Marc Prensky (2001) and that web 2.0 e-learning tools are transformational, learning can be made stimulating, captivating, interesting, up-to-date and be presented in diverse formats supplementing traditional pedagogies thereby facilitating a learner to learn at his/her own pace, own time and own needs.

BLENDED LEARNING

The term 'blended learning' means a learning environment that

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combines face-to-face instruction with technology-mediated instruction (Graham, 2006; Graham, Allen and Ure, 2003). Terms like 'hybrid', 'technology-mediated instruction', 'web-enhanced instruction', and 'mixed-mode instruction' are often used synonymously with 'blended' learning.

It is interesting to know that blended learning is slowly evolving and hence learning can also be beyond the classroom walls. There are distinct blended learning models that range on a continuum from teacher-controlled to pupil-controlled, as have been suggested by researchers and educational think tanks.

Podcasts

A podcast is a web-based delivery system that broadcasts a series of audio files known as episodes usually with a common theme made available on the Internet for downloading to a computer or portable media player which can be received by subscribers on their devices.

Podcasts are unique in that once a user subscribes to a podcast; a 'podcatcher' programme will then automatically download a new episode each time the media file becomes available, so that the user does not need to check for these updates manually.

Significance of the Research Study

What makes podcasts special in learning?

According to Huff (1991), using latest digital technologies is understandable or for that matter even commendable, but their use should be grounded by a sound educational rationale.

Podcasts are powerful because in real time they can be used as:

- *Substitute material* — a learner can access an entire podcast which is an actual substitute for what is taught in the regular class.
- *Supplementary use* — it can be used to provide supplementary material to assist learning beyond the core material that the teacher teaches in the class. The purpose here is to extend the learner's horizon by extrapolating (broaden or deepen) a learner's knowledge, providing summaries or a review.
- *Creative material* — the mind of the learner can be ignited by presenting conflicting views, ambiguous situations, and fallacies. Podcasts can also be used creatively to spark group discussion in-class and out-of-class. The focus is on generating a knowledge value.

How can a podcast influence face-to-face traditional learning?

- Keeps the learner engaged and motivated in learning as there is a shift in learning from the teacher to a scientifically developed podcast.
- There is learner control as the learner can decide what to listen to. And the order too.
- They can accommodate a variety of auditory stimulation messages such as narratives, stories, debates, etc.

- The podcast encourages listening flexibility as the audio material can be listened to again and again.

Should teachers be equipped in developing podcasts?

Teachers are expected to play a proactive role in designing learning material as the teacher who teaches a particular group of learners knows best about the learners. Though podcasts address just the auditory sense, yet they are powerful in creating a blend in the classroom.

Training student-teachers to create podcasts is an effective way to get them to design and implement constructivist pedagogies and enhance their ICT (information and communication technology) capacities in creating digital learning material to blend the traditional instruction with technology. Learning becomes captivating when children realise the presence of technology in learning. The creation of a podcast by student-teachers is a valuable task because it equips them with a real world skill; it provides an authentic task for them; and above all, it is an ideal means to immerse students in the process of inquiry and generate something innovative.

Objectives

- To develop two audio episodes per podcast per student-teacher.
- To measure the student-teachers' reaction (attitude) towards developing the podcasts.
- To analyse student-teachers' reaction to the use of podcasts in teaching.

Protocol Employed in Designing the Podcast

1. **Teaming**: Student-teachers were allowed to form their own teams comprising not more than four members each. It was mandatory that they belong to the same teaching method, e.g., science or history or mathematics.
2. **Pre-Podcast Phase**: The student-teachers were —
   - trained to conduct a needs assessment;
   - exposed to various modes of capturing audio; and
   - exposed to editing audio using Free and Open Source Software (FOSS).
3. **Design and Development Phase**:
   - Each team had to collaborate with the teacher concerned (in this case the author of this paper) to select the topic;
   - Chunking content;
   - Writing the specifications of objectives;
   - Determining the content validity using cross-group discussion (e.g., maths–maths); and
   - Writing the textual storyboard for the audio episodes.

The Hannafin and Peck (1988) instructional model was used to design the learning object. The three phases involved in the design are as follows.

1. **Perform a needs assessment**: In this case, to expound the Revised Cognitive Taxonomy *vis-à-vis* the original Bloom's Taxonomy.

2. **Design**: The focus here is on chunking content, writing the learning outcomes and writing the script appropriate to learner characteristics.
3. **Develop and Implement**: It is concerned with building the podcast that includes—sequencing the episodes, testing the episodes and uploading on Podomatic.
4. **Uploading and Implementation**: Podomatic was adopted as the Podcaster.

The graphic organiser presented below (Figure 1) will help the reader to understand the order of development of a podcast.

Methodology

Method

The case study approach was adopted in the study and two intact units (50 each) of B.Ed. student-teachers from a College of Teacher Education located in Panaji, Goa were a part of the project.

Sample

The sample for the investigation comprised altogether 99 student-teachers studying the B.Ed. programme in a Teacher Education Institute affiliated to the Goa University, Goa, during the academic year 2015–16.

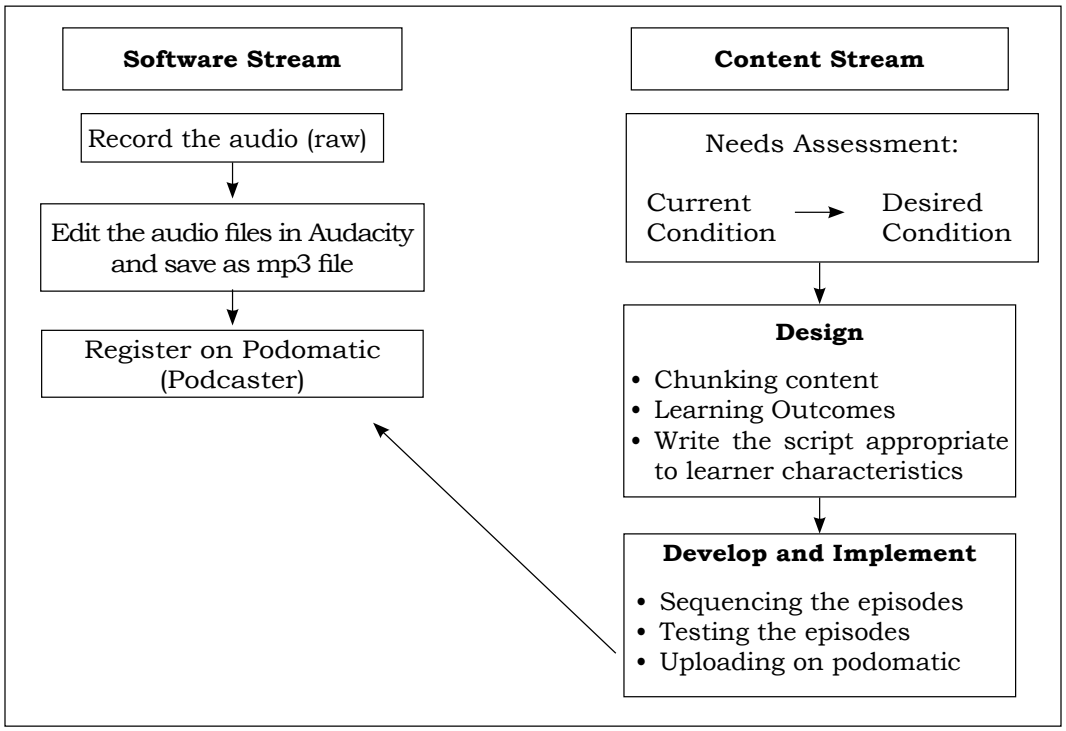


Figure 1. Development of a podcast

Instruments

To collect data the following tools were developed.

1. Digital Materials Development Tool (DMDT) — to measure the student-teachers' reaction (attitude) towards developing the podcasts. The DMDT comprises 16 items and was designed by the investigator.
2. Reaction to Podcasts in Teaching— A single open-ended question to analyse student-teachers' reaction to the use of podcasts in teaching.

Analysis and Findings

Objective No. 2

To measure student-teachers' reaction (attitude) towards developing the podcasts

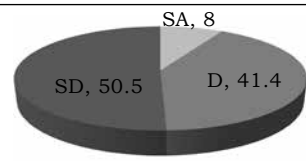
The reaction of the students towards the development of podcasts as determined by the 'Digital Materials Development Tool' (DMDT) was categorised into three categories as: high reaction, moderate reaction and low reaction to developing podcasts.

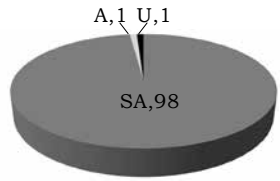
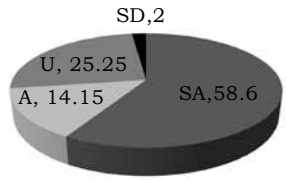
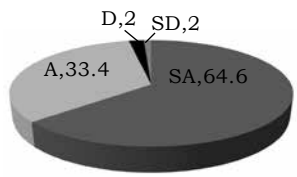
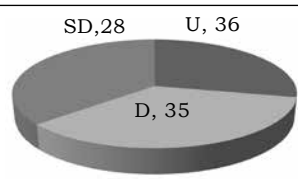
The categorisation for reaction towards DMDT was done as follows: low reaction is less than M-1SD, moderate reaction ranged between M ± 1SD and high reaction is M+1SD.

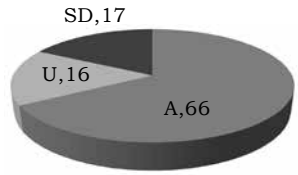
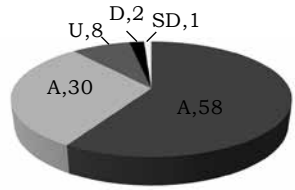
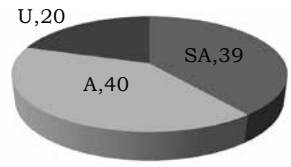
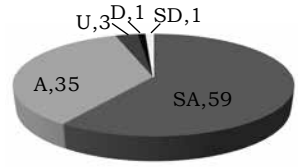
It was found that 15 student-teachers displayed a low reaction, 70 student-teachers displayed a moderate reaction and 14 student-teachers displayed a high reaction to developing podcasts. Being amateurs and developing a podcast was a new experience for all the student-teachers who were a part of the project.

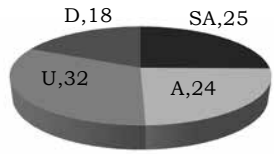
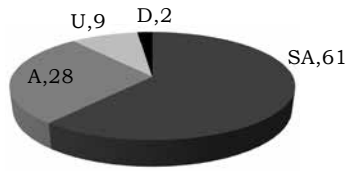
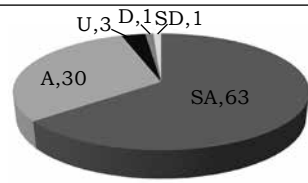
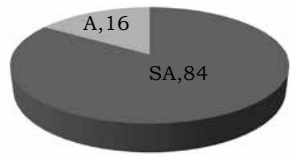
The item-wise analysis of the DMDT is presented in the Appendix.

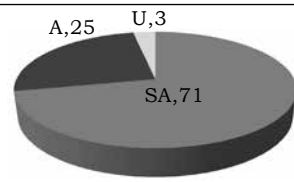
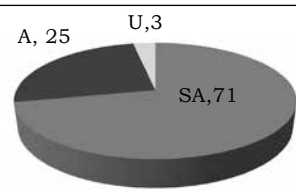
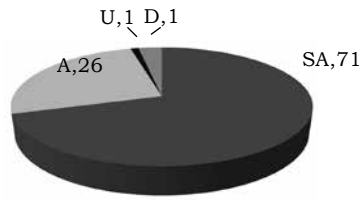
Table 1
Digital Materials Development Tool (DMDT)

S. No.	Statements	Findings (SA: Strongly agree; D: Disagree; SD: Strongly disagree; U: Undecided)
Planning		
1.	It is time consuming to learn a new sound editing software	 • 50.5% of the respondents strongly disagreed. • 41.4% of the respondents disagreed. • 8% of the respondents strongly agreed.

2.	Editing audio in the software is interesting	 • 98% of the respondents strongly agreed. • 1% of the respondents agreed. • 1% of the respondents were undecided.
3.	Calls for integration of personal, social and intellectual competencies	 • 58.6% of the respondents strongly agreed. • 14.15% of the respondents agreed. • 25.25% of the respondents were undecided. • 2% of the respondents strongly disagreed.
Development		
4.	Chunking of content requires a logical mind	 • 64.6% of the respondents strongly agreed. • 33.4% of the respondents agreed. • 2% of the respondents disagreed. • 1% of the respondents strongly disagreed.
5.	Writing a script for the podcast is tedious	 • 28 % of the respondents strongly disagreed. • 35% of the respondents disagreed. • 36% of the respondents were undecided.

6.	Determining the content validity of the audio content takes time	 • 66% of the respondents agreed. • 16% of the respondents were undecided. • 17% of the respondents strongly disagreed.
7.	Creativity and content competence is essential in developing pocasts	 • 58% of the respondents strongly agreed. • 30% of the respondents agreed. • 8% of the respondents were undecided. • 2% of the respondents disagreed. • 1% of the respondents strongly disagreed.
8.	Vocal quality must appease the audience as the podcast addresses only the auditory sense	 • 39% of the respondents strongly agreed. • 40% of the respondents agreed. • 20% of the respondents were undecided.
9.	Language competency is necessary in developing podcasts	 • 59% of the respondents strongly agreed. • 35% of the respondents agreed. • 3% of the respondents were undecided. • 1% of the respondents disagreed. • 1% of the respondents strongly disagreed.

10.	Designing the audio episodes matching the learner chaacteristics such as language ability, age and readiness was difficult	 • 25% of the respondents strongly agreed. • 24% of the respondents agreed. • 32% of the respondents were undecided. • 18% of the respondents disagreed.
11.	Designing a focused audio material is way different from a raw audio	 • 61% of the respondents strongly agreed. • 28% of the respondents agreed. • 9% of the respondents were undecided. • 2% of the respondents disagreed.
Implementation and Uploading		
12.	Testing the podcast prior to uploading is necessary	 • 63% of the respondents strongly agreed. • 30% of the respondents agreed. • 3% of the respondents were undecided. • 1% of the respondents disagreed. • 1% of the respondents strongly disagreed.
13.	Uploading the podcast onto the Podcaster was troublesome	 • 84% of the respondents strongly agreed. • 16% of the respondents agreed.

Overall		
14.	Learnt a new ICT tool to transact the content	 • 71% of the respondents strongly agreed. • 25% of the respondents agreed. • 3% of the respondents were undecided.
15.	Enjoyed the podcast creating project	 • 71% of the respondents strongly agreed. • 25% of the respondents agreed. • 3% of the respondents were undecided.
16.	Lack of ICT skills impedes content development	 • 71% of the respondents strongly agreed. • 26% of the respondents agreed. • 1% of the respondents were undecided. • 1% of the respondents disagreed.

Objective No. 3

To analyse student-teachers' reaction to the use of podcasts in teaching

The respondents were presented with an open-ended question as follows, to gather data for Objective no. 3.

How would podcasts help learners?

The response made by the student-teachers is presented in Table 2 along with corresponding frequencies and percentages.

Table 2
Use of Podcasts in Teaching

Engages students in independent learning	Helps in development of listening skills	Makes learning flexible	Accessibility and uniformity in input
75/99 (76%)	84/99 (85%)	79/99 (80%)	65/99 (66%)

- Table 2 reveals an interesting response made by the student-teachers who designed the podcasts in the case study. About 76 per cent of the student-teachers firmly believe that podcasts do and can keep learners engaged in independent learning. This means that students have the potential to learn independently through podcasts as a tool. Thus, they would learn to develop control over their own learning.
- Listening is the most important skill in learning and about 80 per cent of the student-teachers opine that podcasts can readily step-in and help students to develop their ability to listen carefully and patiently and develop the skill of interpreting what the message in the podcast is all about.
- About 80 per cent of the student-teachers opine that learning becomes flexible in the sense that the learners can learn at their own pace.
- A learner who misses a class may not be at a loss or for that matter, a student who misses a challenging problem in class can have access to it through a podcast that the teacher intended to blend in with the traditional class.

Conclusion

Though the going was tough, it was heartening to see that almost 85 per cent of the student-teachers displayed a positive reaction to developing podcasts. Even the item-wise analysis reveals very encouraging and supportive evidences that the student-teachers enjoyed developing the podcasts and also developed their ICT skills. Through the project they have also realised that podcasts can play an important role in a blended classroom.

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Dynamics of Parent Engagement in Preschool

KALPANA VENUGOPAL*

Abstract

This is a narrative of the engagement of parents and family in a preschool. The purposive strategy of action planned in the study is detailed. It entails vivid descriptions of creative ideation, designing, development and process of parent and family involvement in supporting school activities and initiatives. The discussion that ensues draws on the underpinnings to establish the implication of meaningful engagement between the home and the school.

INTRODUCTION

Education is a major concern of the community and therefore the participation and involvement of parents and the family in school is pivotal. Parents have a right to be involved in schools where their children are being educated. No one knows the child better than the parents and family, so schools can learn a great deal from parents' intimate knowledge of their children. Involvement of parents and the family facilitates the relation between the school and home (World Bank, 2007). Relationship with parents and family may be a way to avoid unexpected intrusions and to reduce antagonism and adverse relations between the community and the school. They can provide the much-needed resources and other volunteer support to the school, such as financial, free labour (development of teaching-learning material), sponsorship and expertise. Involvement of parents and family can improve schools' can accountability and make the school more responsive to the needs of the community. Enhancing family and parents' participation in the school may help increase student development. In other

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words, community's involvement augments parental involvement and parental involvement in schooling in itself is believed to positively affect children's achievements, attitude, and aspirations, in spite of students' ability and family's socioeconomic status (Epstein, 1995).

In short, the involvement of parents and family in schools makes good sense for several reasons: to gain access to knowledge that parents and family have of their children; to augment learning; and to build an effective support system for schools. The school may need to work with parents and families, not just by demanding more from them, but also by focusing on them as members of the community, and by reckoning how they can be an integral part of the educational conversation.

The preschool in the present study is a multi-cultural hub with children from different social, economic and cultural backgrounds. From the frequent meetings with parents and family members, it was found that they had keen interest in getting involved in the school for the benefit of student learning and in supporting school activities and initiatives. Though the school is well-funded and established as a project of a national institute with ample well-trained staff, the intent of parents was considered positive as the school could provide a platform for engaging meaningfully with parents and the families of these children. Thus, it was proposed to plan for a significant involvement of parents and family. The objective was to involve parents, family members and their contacts in the community as volunteers or in other services and activities in the school.

This entailed an in-depth survey of the family in terms of its constituent members, professions, interests, hobbies and talents. Some of the families were nuclear, whilst others were joint with aunt(s), uncle(s) and either both or single grandparent. In some homes all adults were employed and in others there were one or two who were not employed outside the home. Some of them were self-employed entrepreneurs and worked from home too. This was matched with varied ways by which they could contribute in the school. Thereafter, a series of well-planned and focused meetings and discussions were arranged with small groups of parents and families to identify ways of involvement in school activities. Some of them were clear about their own initiatives. They were clear about the extent to which each one would realistically involve and contribute and the *modus operandi* of functioning. After the activities were launched, critical feedback enabled to refine and retune.

Underpinnings

Medical services: Two parents, employed as doctors, of which one was a government practitioner and the other an ENT specialist in the neighbouring institution for the

hearing impaired. "As a practicing Physician I can conduct preliminary health check-up for the children free of cost in the school on Saturdays or other holidays. I can also bring in two other pediatric friends to join us in this service." They organised and monitored basic health check-up in school by arranging for visits of physicians and clinicians; prepared health cards for children; and guided parents by arranging for check-up with specialists in case of specific problems such as vision, hearing and speech, locomotor and other physiological problems. They continued to support parents of children with special needs by arranging for referrals and counselling. They arranged for a pediatrician to address parents about nutrition and better parenting. Parents shared, "This talk was very useful since I learned ways to develop the right eating habits for my child", "The recipes of including a little vegetable and fruit in every dish for him was very useful."

Preparation of teaching-learning material: Five members were closely associated with the school in designing and preparation of teaching-learning material such as rag dolls, stuffed toys, organic clay, paper pulp toys, wooden toys, models and props. One of them, a tailor's wife, not only supplied pieces of cloth-rags, but also trained two grandmothers to design and make rag dolls and stuffed toys. "I have plenty of waste cloth bits which can be reused for making stuffed toys, and I can teach others to make the toy cover for stuffing." Another, a carpenter supplied toys, models and props made during his free time. And yet another, a grandfather, prepared organic clay, paper pulp material and vegetable dyes. Based on frequent discussions with teachers about the syllabus for each month, they planned, designed and developed learning material. They created doll-houses, props for story, drama and dance puppets, masks, toys, dolls and models.

Integrated artwork: Two parents designed integrated thematic worksheets for various concepts in the curriculum in consultation with teachers. They included worksheets for numbers, self and environment and language integrated with art. They designed these sheets with drawings, dotted lines and incomplete figures. They also aided teachers in designing art activities such as finger and vegetable painting, craftwork, beadwork and bunting making. "These parents are creative in giving ideas for the concepts that we want to teach, they prepare a draft and then we refine on it before preparing the worksheets for the concept", remarked a teacher. They also contributed in designing and developing wall posters in classrooms for school celebrations. A parent who was a retired art teacher worked on the artwork of the thematic sheets, along with another parent who was

the mother of one of the students who associated with this work because of her interest and free time.

Music, dance and theatre: Two members keenly engaged children in music, dance and theatre. One was a retired music teacher and the other a talented mother. Children enjoyed their company in learning song and dance steps, accompanied with simple instruments like the jingles, keyboard and drums; role-play of interesting characters of stories; composing short rhyming songs for various concepts in the syllabus.

"I like Arjun's mom to teach us song and dance along with Mona's grandpa playing the drums", remarked Pavitra. They helped teachers develop story characters, song and dance movements for the integrated themes for each month's syllabus and also in organising various literary and cultural events.

Involved celebrations: Parents, especially mothers who were free, associated most willingly for school celebrations. They aided in preparing costumes and facial make-up for children and in managing them off-stage. Sheba, a mother shared, "As I am free I help in the activities with the teachers, and I enjoy dressing the children for various programmes." They accompanied children to the places of event such as other schools and host venues. Since the school is a multi-cultural hub, children celebrated different festivals in school. Some parents took initiative in arranging traditional festivities such as decorations, dressing children in special attire, preparing festive delicacies and helping children stage drama and music about the festive theme. Some such celebrations were *Ganesh Chaturthi, Holi, Baisakhi, Sankranti, Rakhi, Deepavali, Dussera, Krishna Jayanti, Christmas, Eid, Easter, Guru Nanak Jayanti, Budhapurnima, Rajyotsav.*

Associated activities: Some parents also assisted in accompanying children on field trips to the zoo, community visits to post office, railway station, museums, market, bank, gardens and farms. They aided in the arrangement of transport, took care of children during the travel and at the venue, served refreshments and extended help during emergencies on the trip. A parent who was employed in a transport agency arranged transport for all outdoor activities, since the school did not have its own transportation facility. A parent employed with the railways arranged for a visit to the neighbouring railway station by a trip on the train. He also ensured special security for the children. Another parent employed in the post office arranged a trip to the post office and provided for postal envelopes and children posted handmade greeting cards to their parents in these envelopes. A grandparent working on a coconut grove nearby arranged for a visit there and shared his joy thus, "it's a pleasure to see them all crowd around

the tree and watch the men climb up to get them coconuts. They have so many questions about this feat." Children learned about the coconut tree and the uses of various parts of it and also enjoyed a refreshing coconut water drink provided there. Some parents also arranged for visits of local artisans and such others to the school, such as a snake charmer, magician, potter and a piper.

Emergency assistance: Some parents also extended help and support during emergencies. One parent who was an auto driver was always available during emergencies to rush to the nearby clinic. He also provided the school with the contact numbers of some of his co-workers who would assist in his absence. Similarly another parent who was a van driver, supported during emergencies, and also for transporting purchases of material for the school from the local market.

Initiated celebrations: Parents initiated the celebration of teacher's day and children's day. They organised activities for teachers and children, felicitated teachers and arranged for school parties. "Our children are cared for most lovingly by the staff, and in return I feel this is a small token of appreciation by gathering together for a celebration", said Vinci's dad. Parents and family members decorated the venue, staged cultural and literary activities and conducted games. They made creative little handmade gifts for both teachers and children. "I was very excited about the surprise party for the teachers and aunties, all of us kept this secret till the last date", shared little Manu.

Collaborative school maintenance: One parent, a civil contractor helped in painting the school gate, fixed the pipeline from the overhead tank, provided additional electrical points, installed the water purifier, carpentry fixtures, and repair of door knobs and bolts. He sent his employees on phone-call-demands and promptly attended to the school requirements. "Mr. Karim is always helpful in extending a hand with any repairs in the school", appreciated a school staff.

Collection of material: Three mothers volunteered to collect various material for the school, which, neighbours and other parents want to give away. It included toys, bicycles, sports items, storybooks and other such material. They checked the suitability of the material for use by children, and if required got it repaired and renewed for use. They went on monthly collection trips based on the contributors' phone calls and requests for collection of items.

Discussion

The gains in this venture of engaging parents and family in the school are multitude (World Bank, 2007). The foremost being, resources were amply brought into the portals of the school. Be it human, material, ideation, talents or services, anything that was required was taken care of by the parent force. Creative ideation,

designing, development resulted in varied learning resources for relevant curriculum (Anderson, 1998). They generated a treasure-trove of learning resources in the school. There were not just sensitive to the needs in the school but were also able to reach out at all times to manage and address problems and issues. There were issues about emergency transport, medical services and building repairs.

This engagement resulted in creating and nourishing a sound community–school partnership. The engagers were not just parents and the immediate family but they enabled to bond the school with other members and associates of the community too (Botes and Van Rensburg, 2000). It also enabled them to realise some of the tenets of democracy wherein the school was open to their ideas, views and opinions. They were willing to engage in a dialogue with the school. It increased the accountability on both sides. Teachers and parents realised that they were accountable to each other, for both were equally responsible for the progress of the child's development. Neither partner entertained unrealistic expectations. The engagement further ensured sustainability in school programmes and activities, as the engagement was viable and dependable. It would also be worthy to state that the feedback from parents and family was that this engagement actually improved the home environment in more than one way. The interactions between parent and family groups enabled them to carry home much learning that actually aided in coping with challenges at home.

The challenges that ensued from this deliberate engagement are noteworthy for furthering parental involvement. Parent–school engagement tends to overlook complexities and questions of power and conflict within communities (Crewe and Harrison, 1998). Parent and family groups are not homogeneous nor do they have mutually compatible interests. Differences occur with respect to age, gender, wealth, language, culture and so on. Even though marginalised or minority groups may be physically present during discussion, they are not necessarily given a chance to express their views to the same degree as others. The conduct of meetings with parents and family is demanding in terms of time and people management. Teachers become resistant when parents tend to be overtly critical. They tend to feel that they are losing authority within school, as parents incline to be overpowering. But the benefits of such an engagement outweigh the costs. Therefore it is imperative to understand the nature of parent and family groups involved, assess the dynamics of involvement and accordingly establish relevant communication channels (Epstein, 2000).

Thus, in preparing and implementing any efforts to promote parent and family involvement in education, it is important to understand the whole picture of their participation: how it

works; what forms are used; what benefits it can yield; and what we should expect in the process of carrying out the efforts. A deeper understanding of the dynamics of parent and family involvement in the school is imperative for not just larger gains in learning and teaching but for bringing the home and the school closer (Rugh and Bossert, 1998). This inculcates positive thinking in children when they see their parents participating and contributing effectively in the school. Children no longer feel that the school and home are two worlds apart (Isham, Narayan and Pritchett, 1995).

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BOOK REVIEW

Schooling, Socialisation and Identity
A Textbook for B.Ed. Course

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Socialisation is a lifelong process that facilitates internalising the norms and principles of society, the way society functions and expects us to conduct ourselves. Almost all the behaviour patterns learned by us are a reflection of our interaction with different representatives of society. These important representatives come in the form of family, school, peers and media. What we call human nature is actually the learned behaviour with different representatives and at different levels. The society, the school and others are therefore responsible in establishing the identity of the individual and this identity becomes an integral part of the personality.

The book under review titled *Schooling, Socialisation and Identity — A Textbook for B.Ed. Course,* published by NCERT has been written with the central theme of social identities, their importance and nature of their formation.

The book aims at generating awareness about the role society and school play in establishing the identity of an individual and the need of better understanding between the teacher and the learner.

This book has been skillfully conceptualised in seven chapters.

Chapter 1 on 'Self and Society' starts with the basic contention that society is the whole, the individual is a part and the behaviour of the individual has to be seen and understood in the light of the whole, i.e., the society. The making of the self and mind and the contribution of culture for acquiring complex skills, knowledge and their transfer has been conveyed competently in this chapter. There is a clear mention of the importance of social psychology

in shaping up the behaviour of an individual in the dynamic ongoing social process. The vital part of the message in this chapter is the focus on the dynamic relationships of human beings and the society as stated in the theory of George Herbert Mead whose book *Mind, Self and Society* has been recognised the world over.

Greeting another person as per the culture has been discussed well and supported with an activity. The relationship between society, mind and self with essential point of enquiry and social theory has been explained using simple language and day-to-day examples.

The chapter also briefly covers the role of social institutions and socialisation, kinship, marriage and family, many faces of community, neighbourhood socialisation, cultural capital, etc. There are seven activities to support the various dimensions of self and society. The relationship between the self and society, various dimensions of socialisation and the role played by cultural capital in different contexts has been explained well.

Chapter 2 on 'Socialisation and its Dimensions' starts with the constitutional provisions and commitment of the Constitution to provide free and compulsory education to all children up to the age of 14 years. Addition of Article 45 of the Directive Principles of State Policy, 86th amendment of Constitution, Article 21A to introduce Right to Education Bill–2005, Free and Compulsory Education Act (April 2010) have been kept in mind while framing this chapter on socialisation and its dimensions, social inequality and constitutional equality. The pain and longing of a child who wants to go to school has been beautifully illustrated through a poem titled "Watch you going to School".

The identity of the child as a citizen of India, the rights of the child irrespective of the State he/she is born, the laws governing the State and the consequences of the violation of the laws, has been explained well in this chapter. There is also a mention of plurality and diversity at the time of partition of the country and national movement. In addition, the chapter makes a passing reference of distinct religious groups in India and their strengths in making India a culturally and traditionally a rich country. Growing up gendered, boys and girls going to separate schools, skewed male and female sex ratio in the country, caste system and diversity of India from various perspectives have been well elucidated. The chapter is supported by five relevant activities, pictures and a case study.

Chapter 3 covers 'Self, Person and Identity'. The focus of this chapter is on the issue of identity. The interconnection between the self, person and the identity has been beautifully put across. Several questions which arise while establishing the identity and the concept of self have been answered with the help of some statements

which are actually the expressions of children, adolescents and young adults. The development of self which includes self-concept, self-esteem and self-efficacy and the relation of self with family, peer, school, teachers, etc., have also got a mention in this chapter. The parenting style and parent–child relationship, teacher and schooling experiences have been covered quite well.

Three case studies to understand the role of teacher and its relation as well as influence on children has been stated aptly. The chapter has elaborated on the concept of identity, its diffusion, foreclosure, moratorium and achievement. The beliefs as shared by famous psychologist Rogers and Maslow having unlimited potential to promote the goal of self-fulfilment have been explained rationally. The sense of self and the understanding of the conflict arising out of beliefs, value systems, ideology and public personal image have been effectively covered keeping in mind the heterogeneous, diverse nature of the surroundings, the processes of globalisation, urbanisation, internal and transnational migration, growing complexity of cultural relationships, etc.

Chapter 4 is based on 'School Culture and Hidden Curriculum'. This is a very relevant chapter of the book being reviewed. We are aware that the curriculum of the school which means the content to be taught is pre-decided. However, the teaching in every school goes beyond the specified framework of curriculum. The ethnicity of the school, even though not particularly mentioned in the curriculum plays a significant role as it has the natural message and the culture of the school set in it. In this chapter, case studies have been cited explaining the intended purpose of assessment for giving children credible feedback on their progress. What has been very beautifully explained in this chapter is the fact that children who are valued and recognised for their academic achievements by teachers and labelled as superior may not have other abilities which children labelled as academically inferior may possess.

The role of social faculty in creating these hierarchies has been explained well and supported by some reflections. The best part of this chapter is questioning the idea of able-bodied and able-minded. A pictorial presentation of a case and excerpts of an interview published in a magazine make an interesting reading. There is so much emphasis on inclusion in education these days. This chapter reinforces the importance of recognising the socio-economic and structural conditions of operation which can have far-reaching impact on impairment and disability. The powerful force of hidden curriculum with good intentions for the stakeholders has been explained well.

Chapter 5 is on 'Schooling and Identity Formation: Role of Schools'. The importance of the role of a school

in identity formation of the person is an established fact. The phase of transition for a child while shifting from home to school and forming new identities has been covered quite well and supported with an interesting case study. Defining the role of school as a social institution, the expected functions of the school and shortcomings if any have been explained in the light of the views of thinkers like Michael Apple, Avijit Pathak and Krishna Kumar, who have opined that conventional schools may simply be teaching children how to be submissive and how to accept mindless instructions from the powerful, as many activities according to them have little purpose.

There is a detailed mention of the identity in rural schools and different types of school. The importance of communication between teachers and students and the role it plays in establishing relationship between teachers and students has been adequately explained. The role of mother tongue as medium of instruction, its importance in better teaching-learning has been rightly emphasised. This chapter is supported by activities, pictures and a case study.

Chapter 6 is on 'Role of Education: Towards a just Peaceful Living'. It gives an overview of the modernity and globalisation. This chapter talks about their effect on changing the social, political, economic and cultural fabric of the nation which has come to us with advantages as well as disadvantages. Conflicts arising out of modernity and globalisation and the need of educating children to accept differences and understand issues at a deeper level have been explained in simple and logical manner. The chapter emphasises the need of determining the nature of education and its impact on the classroom teaching techniques and assessment. Articles 29 and 30 of the Indian Constitution on minorities and cultural diversity have been aptly quoted while explaining the issues like cultural identity and critical pedagogy. The differences and the diversity prevailing in our society in schools and classrooms and the role a school can play in addressing inequalities has been clarified in simple and understandable manner.

Chapter 7 deals with 'Evolving Identity as a Teacher'. The need and the importance of the process of socialisation and the role played by teachers have been clearly brought out in this chapter. The identity of the teachers in relation to their professional responsibilities has been elaborated quite well.

There is a fairly elaborated account of pre-service education, values and beliefs of a teacher and the socialisation process. Talking about the identity of the teacher, this chapter highlights the ethical and moral dimensions of this identity as well as the importance of the role played by the teacher as a facilitator and co-learner. Related activities have been incorporated in this chapter to make it meaningful and interesting.

This book as a textbook for B.Ed. course can be termed as an outstanding work done by NCERT because of its relevance in terms of quality of content and simplicity of presentation. Keeping in view the price of the book, the paper quality, the printing clarity and quality contents, the book is very useful for the student-teachers, teachers and teacher educators. All the seven chapters in the book are meaningful and supported with important case studies.

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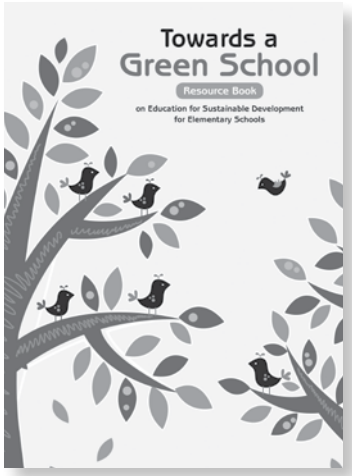

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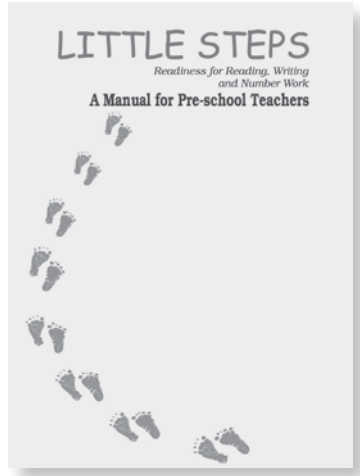

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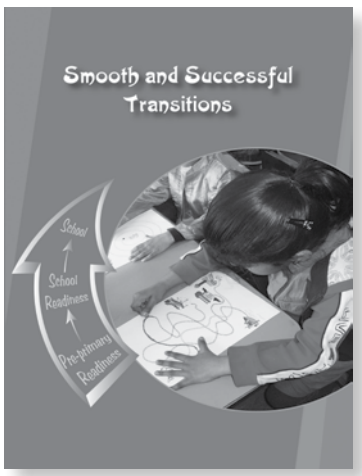

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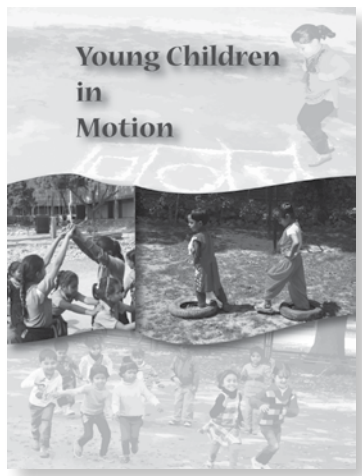

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