CHAPTER 1: CONCEPTUAL FRAMEWORK

1.0. INTRODUCTION

The principle goal of education is to create men who are capable of doing new things, not simple of repeating what other generations have done--men who are creative, inventive, and discoverers

- Jean Piaget

Thus, what is now being advocated is a blue print for change. Some of the broad recommendations for education would now be a deeper understanding of facts in place of superficial knowledge; integrating skills, topics and disciplines in a meaningful and not isolated context; promoting student's learning that is active, interactive and life-long over student passivity and isolated learning.

Importance of education can only be understood if one knows what education stands for. The word education is derived from the Latin word meaning 'to draw out'. Thus, true education is the drawing out of the mental faculties that are so essential for leading a happy and successful life.

Our Indian Education system traces back its existence to the ancient Indian education which was modeled on the 'gurukula system' in which emphasis was placed on the direct relationship between the guru (teacher) and the shishya (pupil). It further progressed with various education systems like Muslim Education System, Buddhist Education system, etc. The education systems during those days were traditional in their outlook and laid great emphasis on religious and philosophical education rather than secular education.

Secular education received an impetus even in Western Europe only after the 17th century, and more recently since the 19th century when the idea of scientific knowledge emerged. The modern education system that we find in India today came with the Britishers. They were accompanied by Christian missionaries who established schools to impart secular education to the Indian children but also to convert them to Christianity. Britishers had planned three stages of education in India: Primary, Secondary, and Higher Education, which is now bifurcated into Pre-primary, Primary, Upper Primary, Secondary, Higher Secondary and then Higher education. (Cheney, G.R., Ruzzi, B.B., & Muralidharan, K., 2005.)

The system of education that was established by Britishers had an underlying objective to suit their own needs and further their interest of only administration of complex and pluralistic society. They transformed the education into a commodity available to only those who could afford to purchase it. The British education system aimed at generating administrative clerks and not thinkers and it is perpetual even today to some extent.

1.1. HIGHER EDUCATION SYSTEM OF INDIA

India has travelled a long way in education, from the "Guru -Shishya" practice of learning under the shade of a tree in medieval times, to becoming the second largest in the field of higher education world over after United States. With 700 universities and more than 35,000 affiliated colleges enrolling more than 20 million students, Indian higher education is a large and complex system.

1.1.1. Evolution of Higher Education System in India

What is higher education? To put it simply, it is a stage of learning that occurs after secondary education at the Universities, Colleges and Institutes of Technology. The aim of higher education is to prepare a person to play his part well, as an enlightened member of society.

Higher education in India is evident right from our ancient time. India had variety of ancient higher learning institutes, but some of our prime higher learning institutes were: Puspagiri, present day Orissa which was established in 3rd century A.D.; Nalanda was established in 5 A.D. in Bihar; Takshashila's existence dates back to 5^{th} or 6^{th} century B.C.

All these ancient Institutions were far more advanced in terms of different field of studies and subjects offered, as compared to today's institutes of higher education. The students were not restricted merely to one field of study. They were made to study subjects like fine arts, medicine, mathematics, astronomy, politics and the art of warfare, i.e. the combination of all the subjects.

In Pre-Independent and Post-Independent period, higher education system evolved significantly. The Compulsory Education Acts passed during the period 1921-1937 gave a great impetus to better quality of higher education.

During post-independent period, the exercise of higher education transformation started with the constitution of the University Education Commission (1948) with Dr.

S. Radhakrishnan as its chairman. The Commission was appointed to report on Indian University Education and suggest improvements. In order to have a global view of education, another Commission under the name of Education Commission was set up in 1964 under Dr. D. S. Kothari as chairman called the Kothari Commission. One of the aims of Kothari Commission was strengthening of the Centers of Advance Study and setting up of a small number of major universities which would aim at achieving high standards in education. (Altbach, Philip G., 2005)

On the basis of the viewpoints available from various social organizations and committees, expert bodies like that of University Grant Commission (UGC), National Council of Educational Research and Training (NCERT), National Institute of Educational Planning and Administration (NUEPA) and numerous regional and state level bodies were formed

Today's higher education system has restricted the student's caliber in customary three year degree programs with little or no scope of skill development, as it restricts the student's caliber to simply study one field of study that they have chosen for specialization. However, with the inception of concepts like Interdisciplinary, Trans-disciplinary approaches as well as the integrated courses in Higher Education System of India, we are on the threshold of a massive transformation in the scenario of Higher Education.

The Indian education system is demonstrating a gradual adaptation of the 10+2+4/5 concept viz. 10+2 years of schooling, and 4 years of dual degree program, which is termed as 'Integrated Education programs.' The Teacher Education program, which used to be one year, is also undergoing a change with the introduction of Integrated Programs like – B.A. B.Ed. and B.Sc. B.Ed.

1.1.2. Evolution of Teacher Education System of India

The origin of teacher education can be prominently traced back to early 19th century. State initiatives for teacher training were ensured in 1815 which is one of the earliest recorded views in support of the training need of schools teachers. In 1947, at the eve of independence, there were 650 training schools with enrolment of 38,770 students. The number of secondary training colleges all over the country was only 42 with an enrollment of 3100 teacher trainees. In the field of teacher education, many new trends and innovations have emerged in our country and abroad.

After independence, Government of India took the task of reconstruction of Indian education on priority basis. Likewise many Committees and Commissions were set up by the Government of India for strengthening the system of teacher education in India.

There are mainly three types of teacher training institutions for imparting training to teachers of elementary, secondary and tertiary levels of education respectively. In pursuance of the proposals of the National Policy on Education (NPE) 1986, the Government of India has established 48 Academic Staff Colleges (ASCs), which impart in-service training to teachers in Higher Education. (Rao, D. Pulla., 2009).

As per the statistical report of MHRD (Statistics of School Education, 2010-11), India has 2100462 and 1887343 teachers in primary and upper primary schools respectively, out of which 90% of the teachers from each categories are trained.

This show that still there is a significantly large percentage of untrained teachers working in the schools at all India level. Thus, there is a dearth both in terms of numbers and the quality and conscious efforts would have to be made to generate better quality of teachers.

1.2. INCEPTION OF INTEGRATED TEACHER EDUCATION PROGRAM

1.2.1. Meaning of Integrated Course

'Integration' as the word suggests means the action or process of integrating i.e. the action of combining things to form a whole. (Pocket Oxford English Dictionary, 10th edition, p. 474). Therefore, we may develop the meaning of integrated course as, 'a course that covers several subjects or integrates several subjects, emphasizing the interlinkages between them.'

An integrated study program comprises of a curriculum that is jointly designed by two or more disciplines and is regulated by a specific set of guidelines. Students who choose the program undertake defined periods of study in each institution or discipline in terms of duration and content. At the end of the courses and after relevant examinations, students are awarded a single qualification jointly signed by the academic authorities of both institutions and/or disciplines.

1.2.2. History of Integrated Program in Teacher Education

1.2.2.1. The period of 1960's in education

The period of 1960 was an innovative period in education. In 1961, Ministry of Education established NCERT with an aim to devise improved techniques of training and building competent professional leadership. As a result, a new thinking developed in the field of teacher education which was to make B.Ed. course an integral part of graduate degree program. Instead of B.A., B.Sc., B.Com, degrees taken separately, four year degree course would provide the student degrees of B.A. B.Ed., B.Sc. B.Ed., and B.Com. B.Ed., depending upon subject matter of the specialization. This degree was to be taken in four years after 12 years of higher education i.e. 10+2+4.

NCERT then established the Regional Colleges of Education at Ajmer, Bhubaneshwar, Mysore in 1963-64 and at Bhopal in 1964-65, in which concurrent and integrated programs were introduced with the intention to prepare the teachers fully in terms of content of the subject matter and the teaching methodologies. This experimentation was aimed at producing a better and more effective model of teacher education than the prevailing one year pedagogical training after graduation in a degree college. Similar experiments were also made in Kurukshetra University and Sardar Patel University in Vidyanagar. But before the experiment could take its root, the review Committees like Nag Chowdhury Committee, Kapoor Committee (1974), Mathur Committee (1978) etc., which were set up in regular interval recommended certain suggestions against the four year integrated course, as a result this course in Regional Colleges of Education were discontinued. But after few years, the four year integrated courses in the Regional Colleges of Education were restarted and continuing till today. (Dibakar, S., 1992)

1.2.2.2. Kurukshetra Experiment

Adoption of the four years integrated teacher education program on the lines of teachers' college of U.S.A. in which academic and professional courses were taught simultaneously started in July, 1960 in the College of Education at Kurukshetra. This was on the forceful suggestion of Late Dr. A.C. Joshi, the then Vice-Chancellor of Punjab and Kurukshetra Universities who, having been impressed by the program of teacher education in the U.S.A. convinced the then Punjab Government which later studieD the detailed program and approved it for implementation. Thus, the College of Education came into existence.

The courses of the scheme were so decided as to prepare teachers of subject matter specialities with thorough background in their subject areas in high schools. The pre-service teachers were to read an advance course in subject matter specialisation along with minor courses in other subjects. They were awarded the degree of B.Sc. (Education), B.A. (Education) depending on the subject areas.

The courses were revised in 1966 and brought at par with B.Sc./B.A. courses of the University in order to facilitate these graduates to take admission into post graduate classes. Over and above the courses for B.A. / B.Sc. they were having additional professional courses equal to the B.Ed. course. The degree was revised to be B.A. B.Ed., B.Sc. B.Ed., instead of B.A. (Education) / B.Sc. (Education). (Dibakar, S., 1992)

1.2.3. Need for Integrated Courses in Teacher Education

The Indian Education Commission (1964-66) observed that of all the different factors which influence the quality of education and its contribution to the national development, the quality, competence and character of teachers are undoubtedly the most significant. An excellent education system does not happen by chance, but by knowledgeable, reflective, and socially just educators teaching a meaningful and relevant curriculum.

The EFA goals (Education for All) and MDG 2 goals (Millennium Development Goals-2) cannot be realized unless needs of all learners are met and this is highly dependent on teaching quality. Teaching and teacher quality have innumerable definitions and are sometimes linked together and sometimes treated as separate issues.

After the education system in India has got revolutionized; many things have got altered and introduction of integrated courses is one of them. One of the reasons why we need Integrated Teacher training programs - as per one of the articles in the newspaper called, 'The Hindu', dated 27th February'2012, experts from the Regional Institute of Education (RIE) and the National Council for Educational Research and Training (NCERT) have stressed the need for introducing a four-year integrated B.Ed. course to improve the quality of training for teachers.

Moreover, in conventional one -Year B.Ed. programs, students have to rush to learn the methodologies in the span of nine to ten months which is not adequate. Therefore,

one of the major recommendations was the emphasis on introducing an integrated four-year B.Ed. program to help students imbibe teaching methodologies over a period of time while completing their graduation in their subject of interest.

Such programs would allow extensive disciplinary and pedagogical knowledge over the extended period of four years. However, experts say that not many private institutions are prepared to offer such courses, but there is a general perception that the universities can definitely take an initiative in introducing it.

There is a clear need of an integrated approach in Teacher Education as the teaching methodologies cannot be learned in a short period of time and a conventional one year B.Ed. program cannot assure a good quality of teachers.

In four-year integrated teacher education programs, the content of the subject matter as well as the teaching methodologies go hand in hand, resulting into better quality of teachers.

1.2.4. Policy's and Commission's Recommendations

The roles and responsibilities of the teachers have been redefined and hence the onus of being a teacher needs to be enlightened right from the pre-service phase of the teacher. This is not possible through one year teacher education program. It needs extended teacher training education program

It is very well reflected in The Chattopadhyaya Committee Report of the National Commission on Teachers (1983-85) which envisioned the New Teacher as one who communicates to pupils "…the importance of and the feeling for national integrity and unity; the need for a scientific attitude; a commitment to excellence in standards of work and action and a concern for society." The Commission observed that "…what happens in the majority of our Teaching Colleges and Training Institutes is woefully inadequate…" "If teacher education is to be made relevant to the roles and responsibilities of the New Teacher, the minimum length of training for a Secondary teacher should be five years following the completion of Class XII." Reiterating the need "…the Commission recommends that "…to begin with, we may have an integrated four year program which should be developed carefully…it may also be possible for some of the existing colleges of Science and Arts to introduce an Education Department along with their other programs allowing for a section of their students to opt for teacher education." The Chattopadhyaya Commission recommends a four-year integrated course for the secondary as well as the elementary teacher.

Restructuring and reorganization of the Centrally Sponsored Scheme on Teacher Education- Guidelines for Implementation, (2012), emphasized the need for teacher education to be "…brought into the mainstream of the academic life of the Universities on the one hand and of school life and educational developments on the other" (Kothari Commission, 1964-66). It is indeed a matter of concern that teacher education institutes continue to exist as insular organizations even within the University system where many are located. Recognising 'quality' as the essence of a program of teacher education, the Commission recommended the introduction of "integrated courses of general and professional education in Universities…with greater scope for self-study and discussion…and…a comprehensive program of internship."

The policy emphasizes the sad present state of Teacher Education in the country and makes recommendations for its enrichment, via the introduction of Integrated Programs.

1.2.5. Reflections on four-year Integrated Teacher Training Program as per NCFTE 2009

Isolation of education as a discipline from the system of higher education is identified as one main cause for the continued low status of educational studies. Several suggestions have been made to deal with this issue. One proposal is to diversify specializations into areas of curriculum and pedagogic studies in mathematics, languages, social sciences and sciences and encourage students to pursue post-graduate studies in a chosen discipline along with the option of specializing in a select curriculum and pedagogic study course. It is also suggested that undergraduate students be provided with a variety of routes to pursue studies in education like four-year integrated courses in elementary and secondary education, electives in educational studies in undergraduate programs of general education, followed by a range of post-graduate studies in education, social sciences, sciences, humanities, mathematics, language studies and the liberal arts. Such diverse routes are likely to tap talented and motivated young people to enter into education and pursue options such as teacher education, research, curriculum, pedagogy. (NCFTE, (2009), pt. 5.7,

Upgrading teacher education calls for participatory curriculum planning involving all stakeholders, modular organization of curriculum in terms of critically engaging with

theory and bringing practice within its perspective and a professional approach to teacher education processes. For accomplishing all this, there is a need for a longer duration program, either a four-year integrated model at the Bachelor's degree level or a two-year second Bachelor's degree model. A transition to the new models will need to be done within a definite time frame – say, five years, keeping in mind the time required for preparation of teacher educators as well. (NCFTE, 2009, pt. 1.5, p. 8)

Features recommended for such integrated program was visualized as follows:

- Foundations of Education located in the sociological, historical, economic, ecological, philosophical, cultural and political context and thought in education.
- Core courses to engage with subject-content with the aim to revisit and reconstruct concepts and perspectives.
- Engagement with theory of pedagogy and hands-on experience in understanding the learner, his/her context and processing of thinking and learning as a base to evolve relevant and appropriate pedagogic strategies.
- Pedagogic courses designed in the frame of broad disciplinary areas such as, Sciences, Social Sciences, Languages and Mathematics rather than individual school subjects.
- Theory courses designed to enable inter-disciplinary engagement as well as to engage with theory in the light of personal experiences and social realities.
- Theory courses to include in-built field-based units of study to enable porous boundaries between theory and practice.
- Rigorous study of a chosen liberal course out of a pool of courses in languages, mathematics, sciences and social sciences.
- Opportunities for developing the self through drama, craft, music, self-development workshops along with a critical engagement with theoretical constructs of identity development and the individual-social interface.
- Extensive and intensive practicum courses to equip teachers with a grip over existing systemic issues in education, a developing capacity to rise to the un-certainties of a learning environment and changing learner needs and a capacity to feel empowered to make a difference.
- Practicum courses to develop other professional capacities and sensibilities: the ability to understand learners in context, evolve developmentally and contextually relevant

pedagogies, re-arrange subject-matter to communicate effectively with learners, design and choose appropriate learning experiences activities, learn to observe and document, analyze, synthesize, interpret and reflect.

- Sustained engagement with schools to appreciate the given constraints of a system and to learn to strategize to think out of the box. Understand and learn to negotiate formal learning spaces as sites of struggle, contestation and social transformation.

1.2.6. Recent issues and developments in Integrated Teacher Education Programs

In response to the various ongoing debates and concerns raised regarding Integrated courses, the UGC mandated, "The academic philosophy/rationale behind offering integrated programs should not be for economizing on course requirements or award of double degrees in a fast track. On the contrary, an integrated approach should involve a vertical or interdisciplinary discourse." which means that the integrated courses should not be seen as the short way to get degrees or the most economical way of getting degrees, but it should be seen from the interdisciplinary point of view. Therefore, an integrated or dual degree program will be allowed only if there is no compromise on any of the course requirements, including duration, number of papers and intensity of courses, teaching or learning hours and credits.

Another innovation in the same line has been made by NCTE. According to latest news published by newspaper, NCTE is now going to launch four new Teacher training programs all over India. Intermediate pass candidates who are interested to be a part of teaching field can join B.Ed. Integrated courses called the Bachelor of Secondary Education. NCTE is also going to launch two Diploma Training Programs. The main motto behind taking such initiatives is to improve the quality of education. The Government wants to prepare specialized teacher for special curricula and syllabi. It's expected that first of all this course will be launched in central Universities. Syllabus and Program pattern will be same all over India and admission will also be taken via National Level entrance examination. If everything will be in its place, then it is expected that these Teacher training program will be launched from 2015. NCTE is dedicated to improving the quality of teacher Education. If candidates are interested in 4 year integrated B.Ed. programs then, they can easily take admission after 12th.

The candidates who have qualified Integrated B.Ed. will be eligible for class 8th level teaching whereas, candidates who have qualified 2 year diploma in elementary education will be eligible for primary level teaching for class 1 to class 5. Universities and States can also conduct their own entrance exams for admission to these programs.

1.3. ABOUT GUJARAT

The state of Gujarat was established on 1st May 1960. It is the westernmost State in India, also locally known as 'Jewel of the West'. Gujarat's capital is Gandhinagar and its largest city is Ahmedabad.

Source: probharat.com

As per the 2011 Indian Census Report, the total population of the State of Gujarat was 60,383,628; out of which the rural population comprised of 57.4% and the urban population comprised of 42.6%. The State has 33 districts. The literacy rate of the State according to the 2011 census was 80.18%, reflecting a considerable increase from the rate reported in the 2001 census, i.e. 69.14%. (Gujarat Population Census data 2011)

1.3.1. About GCERT

The schools of Gujarat are affiliated to the Gujarat Secondary and Higher Secondary Education Board (GSHSEB). Many of the private schools in Gujarat are also affiliated to the Central Board of Secondary Education (CBSE) and Council for the Indian School Certificate Examinations (CISCE) and also the IB Board. Gujarat has 13 state Universities and 4 Agricultural Universities.

The Gujarat Council of Educational Research and Training (GCERT) is a pivotal institution at the state level for the enhancement of qualitative education at primary and secondary schools. It was "State Institute of Education" before 1988, which was

later upgraded as a SCERT in 1988, under the resolution of State Education Department.

The upgraded SCERT, now named ad Gujarat Council of Educational Research and Training (GCERT) is a fully structured state level academic institution is controlled and guided by a Government body as well as Executive Committee.

Under the umbrella of GCERT, there are now 26 DIETs (District Institute of Education and Training) functional in 25 Districts. There are seven branches namely Pre-service Teacher Education (PSTE), Work Experience (WE), District Resource Unit (DRU), Curriculum Material Development & Evaluation (CMDE), Educational Technology (ET), In-service Field interaction Innovation & Co-ordination (IFIC) and Planning & Management PM functioning in these DIETs. These DIETs are well equipped with qualified and experienced academic and administrative staff.

The GCERT works as a prominent institution for implementing the policies, programmes and researches in the State. It provides resource support and guidance to all the teacher education institutions and works in collaboration with the NGOs, Subject experts, Educationalists and pioneers in bringing about reforms in the remote and underserved areas of the State. It disseminates latest information with regard to modern trends and approaches in primary education, pre-service and in-service education, pedagogical advances in the country, wide use of distance education as a mode of training, organizing community awareness programmes and updation of curriculum of primary education in view of new and emerging concerns. Even the State Ministry of Education banks upon its expertise.

The Council is committed to bringing about qualitative improvement in school education particularly Elementary Education, development of curriculum syllabi, instructional material and evaluation strategies to explore suitable solutions to educational challenges with the changing time. The GCERT has scaled a unique journey with experimentation from chalk to satellite, scaling an arduous terrain in the field of educational reforms.

1.3.2. Higher Education scenario of Gujarat

Gujarat has 13 state universities and four agricultural universities. The premier management institute Indian Institute of Management in Ahmedabad ranks the best in India and among the best management Universities in the world. The top-notch institutes for Engineering and Research include IIT Gandhinagar, Dhirubhai Ambani

Institute of Information and Communication Technology (DA-IICT) also in Gandhinagar, Sardar Vallabhbhai National Institute of Technology (SVNIT) in Surat, Pandit Deendayal Petroleum University (PDPU) in Gandhinagar and Nirma University in Ahmedabad. Mudra Institute of Communications Ahmedabad(MICA) is one of the most famous institutes for mass communication and is well-renowned across India.

In addition, Institute of Rural Management Anand (IRMA) is one of the leading sectoral institutions in rural management. IRMA is a unique institution in the sense that it provides professional education to train managers for rural management. It is the only one of its kind in all Asia.

The National Institute of Design (NID) in Ahmedabad and Gandhinagar is internationally acclaimed as one of the foremost multi-disciplinary institutions in the field of design education and research. Centre for Environmental Planning & Technology University, popularly known as (CEPT) is one of the best planning and architectural school not in India, but across the world; providing various technical and professional courses.

Lalbhai Dalpatbhai College of Engineering (LDCE) is also one of the top engineering college of the state.

1.3.3. About Vadodara

Vadodara is also known as ‘Sanskari Nagari’, which means a ‘cultured city’ due to rich deep rooted cultural traditions. Vadodara has a vibrant history related to Art and Architecture. Since the era of Royal Gaekwad family, it has been a hub of Arts and Literature. Hence, it has been bestowed the title of "Kala Nagari". Vadodara is synonymous with education. The patronage of education started with Maharaja Sayajirao and the city has built further on the academic infrastructure established by

1.3.3.1. Maharaja Sayajirao University of Vadodara

The Maharaja Sayajirao University of Baroda, Vadodara, is a premier university of Gujarat. It is one of the oldest universities of Gujarat and provides education in Faculty of Fine Arts, Engineering, Arts, Journalism, Education, Law, Social Work, Medicine, Science and Performing Arts. Originally known as the Baroda College of Science (established 1881), it became a university in 1949 after the independence of

the country and later renamed after its benefactor Maharaja Sayajirao Gaekwad III, the former ruler of Baroda State.

The Government of Baroda and its people had for a long time desired to have a separate University of their own. The affiliation of all the institutions of higher education to a University situated far away was not conductive to the development of new courses of instruction suited to the needs of the region. It acted, on the contrary, as an obstacle. The main object of establishing the Maharaja SayajiraoUniverity of Baroda was, therefore,to provide a distinct type of University-a teaching and residential University which should have complete freedom in all academic matters and would be free to institute new branches of studies suited to the needs and aspirations of the region in particular and of the country in general.

The education department was not introduced at that time. It was in 1935, that the Education department came into existence. Moreover, the idea of 4 year integrated program was not reflected in The Baroda University Commission of 1927.

In 1933, Educational Commissioner with the government of India made a survey of Education in the state of vadodara in 1933, wherein he found the paucity of trained teachers in secondary school of the state. He reported the problem in his report and recommended to start Secondary teacher training college. The proposal was accepted by Gaekwad and Secondary Teachers Training College was established in Vadodara in 1935. . It was affiliated to the University of Bombay in the year 1938.This institution became the Faculty of Education & Psychology in the year 1949 as the constituent of the Maharaja Sayajirao University of Baroda with two departments - Education and Psychology.

The department then started with the one year teacher training programs (B.Ed. and M.Ed.).

However, the concept of integrated teacher training program was yet to be introduced at that time. The four-year Integrated Teacher Education Program was the concept introduced for the first time in Vadodara by Navrachana University in 2010.

1.3.4. About Navrachana Education Society

The Navrachana Education Society (NES) is a registered Charitable Trust established in 1965. It is headed by a Board of Trustees comprising of educationists, philanthropists and administrators. With 50 Years of Excellence in Education, the Society is acclaimed for its achievements - for having imparted through its

Institutions, quality education for over four decades. Navrachana Education Society is professionally managed by an Executive Committee, vastly experienced in administration and modern-day education management.

The Institutions under Navrachana Education Society are:

- Navrachana University
- Navrachana School - CBSE
- NavrachanaVidyaniVidyalaya - GSEB
- Navrachana International School – (IB)
- Navprerna (GSEB)
- Eklavya Model Residential School (Vejalpur) – GSEB
- Navrachana Sports Academy
- Navrachana Language Academy

1.3.4.1. Navrachana University

Navrachana University was established through the Gujarat Private Universities Act, 2009 with the intent to offer superior education that befits the high educational standards of the Navrachana Educational Society in Vadodara. The University has embarked on a new educational paradigm that lays simultaneous emphasis on disciplinary education, inter-disciplinary education, professional education and general education. This paradigm is facilitated by the University's unitary character and offers comprehensive learning and helps develop T-Shape students who have a breadth of knowledge though general and inter-disciplinary education and a depth of knowledge though focused disciplinary education.

There are five important aspects that directs the new educational paradigm at Navrachana University: First, professional education must prepare students with strong disciplinary insights needed to address the challenges confronting the professional community and inculcate a sense of lifelong learning to be successful and excel overtime. Second, offer interdisciplinary education that cross-fertilize learning with new ideas from disperate disciplines so collision at the fringes raise appropriate questions and create innovation. Third, general education must inform students about the issues that arise in their lives, personally, professionally, and socially and help them to be reflective about their beliefs and choices, and their presuppositions and motivations. Fourth, make the process of learning more effective through exposure

into real working conditions by practically applying knowledge and skills learned in the classroom. Fifth, invite students to work on "messy", seemingly intractable problems through a focus on social entrepreneurship and address pressing problems in our immediate community. Disciplinary-specific entrepreneurship is being developed to create job creators who will create opportunities for themselves and for others.

Four schools make up the Navrachana University - School of Science and Education with BSc-BEd, BEd, MEd and PhD and a new Program - BSc+ Interdisciplinary; School of Environmental Design and Architecture provides Bachelor of Architecture and Interior Design; School of Engineering and Technology offers Bachelor of Mechanical, Electrical and Civil Engineering; and School of Business and Law offers BBA. BBA-Law, MBA, BCA and MCA. All educational Programs follow modular, semester-wise curricula and allow taking courses that cut across program boundaries. The unitary character allows the University to innovate new educational and pedagogic models grounded in interdisciplinary thinking and capitalize on the shared infrastructural and educational resources to achieve a rich academic and life experience.

1.3.4.2. School of Science and Education

The School of Science and Education provides undergraduate, postgraduate, interdisciplinary, integrated and doctoral programs like – ECCE, BSc-BEd, B.Ed., M.Ed. and PhD and a new Program - BSc+ Interdisciplinary

1.3.4.3. About B.Sc. B.Ed. program

The B.Sc. B.Ed. Program at NU is a 4 year Integrated Science Teacher Preparation Program designed to meaningfully integrate content with pedagogy and prepare future Science Teachers with a science background together with specific training in science teaching related skills to engage their students in future in meaningful science learning.

1.3.4.4. The Case

The study is a case study of an Integrated Teacher Education Program in an urban, private university situated in Vadodara, Gujarat with a student population made up of both local and residential students who primarily come from the local region and surrounding areas. The student body consists of graduate, undergraduate and doctoral

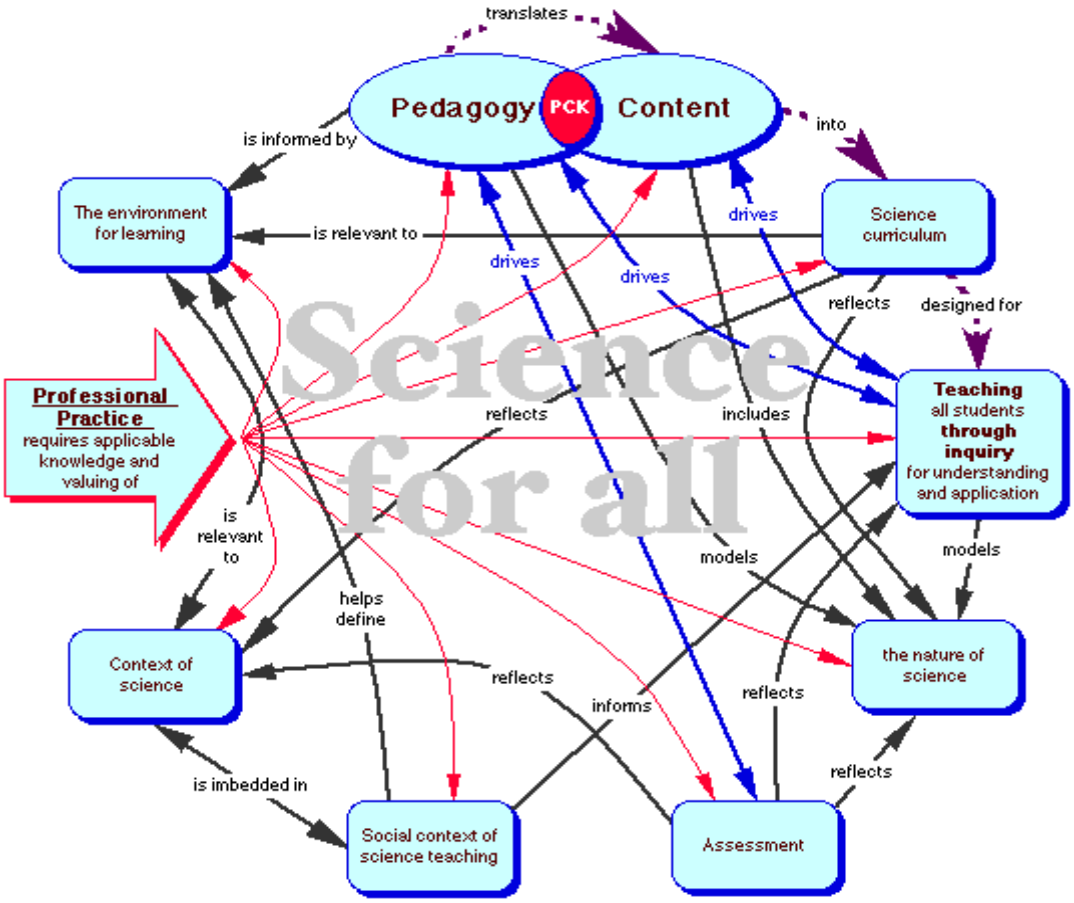
students, faculty and staff. Most students come from the middle class when characterized socio-economically with a fair number of students also characterized as first generation students. The university has a particular focus on the pure sciences, the sciences, and engineering.

The changing realities of the Indian society as well as the school system necessitated changes in transaction and assessment mechanisms in order to be responsive to these changes. In keeping with the above, main thrusts in the program are gicen to - Integrating Science with Education (Pedagogical content knowledge)

- Providing a Variety of modes of learning engagement; Emphasis on field based experiences
- Continuous and Comprehensive Evaluation
- Research Component at the undergraduate level
- Self Development Courses (Extra – Mural Activities, Language Proficiency, ICT, etc.)

The curriculum of B.Sc. B.Ed. program is designed to integrate content with pedagogy meaningfully, in order to prepare future science teachers with a science background together with specific training in science teaching related skills to engage their students in future in meaningful science learning.

The integration of content and pedagogy is explained in next page



Source: 1 https://www.google.co.in/url?sa=i&rct=j&q=&esrc=s&source=images

Figure 1: Integration of Content and Pedagogy

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.0. INTRODUCTION

A literature review is a written document that provides background information on your subject area and details previous research that is relevant. A good literature review is far more than an account of who researched what and when. Therefore, a literature review is done in order to ensure (Engage, 2012.) -

- a thorough understanding of the topic
- identification of potential areas for research
- identification of similar work done within the area
- identification of knowledge gaps that demand further investigation
- whether one has compared previous findings
- whether one has critiqued existing findings and suggested further studies.

Therefore, taking the above mentioned points into account, the researcher has broadly classified the review in four areas, as follows:

– Case Studies of Institutions/School
– Attitudes of Teachers towards Teaching Profession
– Professional Development of Teachers
– Effectiveness of Teacher Education/ Teacher Training Programs

2.1. CASE STUDIES OF INSTITUTIONS/SCHOOLS

Srivastava S and Manvadriya S, (2008), conducted a study titled, **'A Case Study of LokBharti, Sanosara, Gujarat, India'.**

The objective of the study was to find out the aims and objectives of G.B.T.C.; to study its infrastructural facilities, curriculum and its transaction and teacher-student relationship. The methodology adopted was the Case Study method

The findings revealed that the aim of the institution was to prepare teachers based on the principles of Gandhian philosophy. The infrastructure was adequate but in some areas it needed improvement. The curriculum had a focus on agriculture, udhyog i.e. manual work, community life along with other subjects. Its transaction was effective.

The teachers and students shared a close relationship with each other. Some of the problems were related to the computer usage, pedagogy and English proficiency. An intensity index of 4.0 showed that the students agreed with various aspects related to the different dimensions of G.B.T.C.

Iyer. S., (2010), conducted a study titled, **'Case Study of Nav-Prerna School – A School for the Less Privileged Children in Vadodara City'.**

The objective of the study was to know the working of Nav-Prerna school; to study its evolution and development and to identify the working conditions of the teachers and students. Case Study method was adopted.

The findings revealed that the school was established in November'2002 in order to educate less privileged children who remained ignorant due to various socio-economic reasons. The fee of Rs. 50 is charged from the students so that they come to school regularly. The schools starts at 2:10 and is over by 5:45, whereas the students opted for vocational training comes early at 11:00 am till 2:00 am and then join the regular session of the school till 5:45 pm. There are 17 teachers, out of which 2 are activity teachers. Initially, the children of slums were unaware of the socially desirable behaviour and ethics but gradually the school groomed the children in all aspects and today the progress can be seen transparently.

UNESCO Bangkok conducted a widespread research study on, **'Case Studies on Integrating ICT into Teacher Education Curriculum in Asia'** in 2013. Each of the seven collated case studies involved a teacher-education course in Educational Technology, more specifically, an ICT-related course for pre-service teachers as well as for the retraining of teachers. The collection presented differences and similarities in the approaches taken in preparing student teachers in the use of ICT for teaching and learning.

All the case studies reported that they provided lecturers with opportunities to work on and try out the revised curriculum and relevant courses within the respective institutions. The lecturers experimented with the integrated clubbing of ICT with the pedagogy and experienced enhanced level of understanding and skills in the pre-service teacher trainees.

Overview

The studies discusses specifically about an individual institute/school which is unique in its own way. Various aspects studied are evolution and development of an institute, its working [Iyer. S., (2010)], also curriculum and curriculum transaction, administrative aspects and infrastructural facilities [Srivastava S and Manvadriya S, (2008)]. The Integrated Approach is substantially accepted and implemented abroad, as it assures enhanced skills and understanding (UNESCO, Bangkok).

The present study also incorporates various aspects of Integrated Teacher Education program, like evolution, curriculum and its transaction, administrative aspects, infrastructural facilities, etc., of B.Sc. B.Ed. program of Navrachana University, Vadodara, Gujarat, India.

The researcher has taken Case-study as a method of study and hence, the above mentioned researches are helpful in deriving some ideas as to how a case can be presented.

2.2. ATTITUDES OF TEACHERS TOWARDS TEACHING PROFESSION

Aggarwal, Y.P., (1980), conducted a study titled, **'Motivational factors in the choice of teaching as a profession and its relationship with some other variables'.**

The major objective of the study was to identify the motivational factors in B.Ed trainees' choice of teaching as a profession. Survey method was adopted for the study. The findings revealed that- (i) although there were inter group differences in the factors that motivated the students to join teaching, five factors emerged as most important. In order of priority, these were: desire to continue education, possibility of doing good to the country, fondness of teaching, security of job, and parents' wish fulfilment. (ii) Teaching had been consistently a very popular aspiration from high school through college education (iii) A majority of all the groups had no relative in the teaching profession; however teacher spouse influenced the urban girls. (iv) A large majority of the B.Ed trainees wanted to take up teaching but very few wanted to start their own schools. (v) A large majority of the B.Ed trainees belonged to high socio-economic group. (vi) There was no significant difference in attitude towards the teaching of high, middle and low socio-economic status groups.

Bhandarkar, B.G., (1980), conducted a study titled, **'A Study on Polytechnic Teachers Attitude towards Teaching Profession and Its Correlates'**.

The objective of the study were: (i) to develop a scale for measuring teachers' attitudes towards the teaching profession along with stanine norms, (ii) to examine the relationship of attitude towards the teaching profession with teachers' age, qualification, training, job mobility and family problems. The research design was purely quantitative.

The findings of the study revealed that- (i) The mean attitude rating ranged between 3.77 and 9.50. (ii) Compared to the norm developed on the state-level sample, the teachers of both the rural polytechnics had unfavourable attitude; in the semi-urban area the teachers of sic polytechnics had neutral attitude, the teachers of four polytechnics had unfavourable and of one favourable attitude; in the case of urban polytechnics the teachers of three polytechnics were neutral, of one unfavourable and one favourable (iii) On each of the sub-dimensions the mean attitude ratings were the highest for the urban teachers, followed by the semi-urban and the rural teachers although the differences were not significant. (iv) The attitude towards the teaching profession was not significantly related to the qualifications of the teachers. (v) There was a significant and positive relationship between the age of the teachers and their attitude towards the teaching profession. (vi) The trained teachers' mean attitude scores were significantly higher than the mean attitude score of the untrained teachers. (vii) The job mobility and family problems were not significantly related to teachers' attitude towards the teaching profession.

Overview

The above mentioned studies discuss various factors which influence an individual to select teaching as a profession and also their attitudes towards it. The researcher has studied these researches and mentioned it, because the findings of the study outline a dire need for attitudinal shift towards teaching as a profession. As per one of the findings, the girls are influenced by their teaching spouse to join the teaching profession, and not their interest towards teaching. [Aggarwal, Y.P., (1980)] Also, it was found that the teachers do not have a teaching attitude since they join this profession out of no option [Bhandarkar, B.G., (1980)].Hence, from the findings of the above mentioned studies, it can be seen that the individuals lack preparedness to enter into this process. Hence, if right after their higher secondary stage they are made

to be prepared for learning the concepts as well as teaching, they will be better prepared teachers. Hence, the researcher traced out the need for preparedness to enter into teaching profession right after higher secondary stage. It can be achieved through integrated teacher training programs. Therefore, the researcher took up a research one such integrated teacher training program called B.Sc. B.Ed. program of Navrachana University, Vadodara, Gujarat, India.

2.3. PROFESSIONAL DEVELOPMENT OF TEACHERS

Lakdawala, U.T., (1977), conducted a study titled, **'The Professional Growth of Women Teachers of Secondary Schools of Greater Bombay'.**

The main objectives of the study were, to assess the professional growth of the trained graduate women teachers having at least five years' experience of teaching and to find out their in-service training need, also to assess their contribution to the profession and to find out their difficulties in achieving professional growth and finally to find out their job satisfaction. Survey method was adopted.

The main findings of the study were- (i) There was a striking difference between the earlier specializations of the teachers and the subjects they had to teach like English, history and geography. (ii) More than 75 percent teachers had to take more than 30 periods per week; about 65 percent teachers spent more than an hour a day for correction work; and about 53 percent spent more than an hour a day in the preparation for teaching. (iii) There was not a single activity leading to professional growth performed by 50 percent or more of the teachers; the activity of attending courses attracted the highest number of teachers and research work attracted the lowest number of teachers. (iv) More than 25 percent teachers implemented new techniques in the classroom teaching; the three most frequently used techniques were: using audio-visual aids, individualized instruction, and group discussion. (v) Excepting the activity of becoming a member of professional associations, in all other professional activities the proportion of unmarried teachers was higher than that of married ones. (vi) According to teachers the reasons responsible for not doing any writing work contributing to the professional growth were lack of time due to the routine work of the school, lack of time due to the demanding home atmosphere and exhausting school work (vii) Three main reasons for not attending courses leading to the professional growth were want of opportunities, lack of knowledge of such courses and unwillingness to sacrifice vacation. (viii) Only 45 percent teachers were

fully satisfied with their jobs. The reasons for dissatisfaction were mostly the crowded classes and the heavy workload. (ix) By and large, all the teachers were aware of the need to grow professionally, but they perceived shortage of time and lack of incentives as the main barriers for their growth.

Overview

The above mentioned study talks about the professional development of teachers. As per one of the findings, it was revealed that, there was a striking difference between the earlier specializations of the teachers and the subjects they had to teach like English, history and geography. [Lakdawala, U.T., (1977)]. Thus, the concept like B.Sc. B.Ed. program helps the teachers to be professionally prepared for teaching science only.

2.4. EFFECTIVENESS OF TEACHER EDUCATION/ TEACHER TRAINING PROGRAMS

Sharma, A., (2013), conducted a study titled, **'curriculum transaction procedures in secondary teachers pre service training program of Himachal Pradesh an evaluative study'**.

The objectives of the study were : To make the content analysis of curriculum of secondary teachers' pre-service training program, and to study the curriculum transaction process and also to study the availability and utilization of the resources like- Physical Sciences, Life Sciences, Mathematics, Social Sciences, English Language, Hindi Language, Psychology, and technology.

Major findings of the study revealed that the curriculum was planned and transacted considering different philosophical and psychological perspective of education; However, there were various barriers in its execution like- limited time period of the pre-service training program, its monitoring and the over-crowded classes. It was also found that the focus was given on teaching theories. The subject competency part was not in the design of the curriculum.

Marker, N.S., (1975), conducted a study titled, **'Survey of Teacher Education in the State of Maharashtra'**.

The objectives of the study were to survey teacher education in six universities of Maharashtra and to trace the development of teacher education in ancient India, in the

communist countries, and in the U.S.A., the U.K. and Thailand. The survey method was employed.

The findings revealed that – (i) There was substantial increase in the colleges of education since Independence. (ii) Fourfold and six fold increase, respectively took place in the number of secondary schools and students in secondary schools between 1949 and b1971. (iii) Increase in the number of trained teachers was more marked than that of untrained teachers. (iv) There was an upward trend in the expenditure on colleges of education in the various five –year plans. (v) There was no long-term plan of development of teacher education by ht department of education. (vi) Physical resource development predominated human resource development in teacher education. (vii) Diarchy in the administration of colleges of education was a source of dissatisfaction. (viii) The state-level institutions set up for pre-service and in-service education were generally outdated and lacked sufficient accommodation. (ix) All the six universities in Maharashtra offered a general bachelor of education course. (x) The B.Ed. syllabi were revised infrequently. (xi) Policy decisions were processed through the Deputy Director of Education in charge of Teacher Education for Maharashtra. (xii) Students were dissatisfied with the teaching in B.Ed. and evaluation as there was no significant improvement in the quality of teacher education at the secondary level. (xiii) There was a tremendous increase in the number of students admitted to the college of education. (xiv) The four division of Maharashtra, namely, Bombay, Poona, Nagpur and Aurangabad, held the same position with regard to the percentage of trained teachers in each division over the period 1960-61 to 1970-71.

Mohan. K., (1980), conducted a study titled, **'Effectiveness of Teacher Training Programs'**. The objective of the study was to find out the effectiveness of the teacher training programs in the colleges affiliated to Avadh University, Faizabad. Survey method was employed.

The findings revealed that- (i) The teacher training departments did not have adequate buildings or equipments. (ii) None of them had hostels for girl students. The hostel facilities for boys were not satisfactory. (iii) Quite a few teacher-educators were not adequately qualified to supervise teaching practice in the subject in which they were supervising the lessons. (iv) None of the teacher training departments had provision for extension services. (v) The process of admission was too lengthy and took more than two months for completion. (vi) The duration of the training course had become

very short and covered only 118 working days. (vii) None of the training departments had their own practicing schools. (viii) The time spent on practice-in-teaching was too short as schools were not available for a longer time. (ix) The examination for practice-in-teaching had become farce as the examiners did not observe the lessons for adequate time. (x) The majority of the respondents were not satisfied with the efficiency of the training programs.

Sharma, M., (1982), conducted a study titled, **'Progress and Problems of Teacher Education in India'.**

The objective of the study was to examine the growth pattern of teacher education in India, and to identify the problems of teacher education in the country. The research design of the study was purely qualitative.

The main findings of the study were- (i) Even after a lapse of sixteen years, from the publication of the Education Commission Report (1966), teacher education programs had not undergone any marked improvement. (ii) The methods of teaching and evaluation being used in training institutions were traditional. (iii) There were evidences to show that there was lack of research data in the field of teacher education. (iv) There was dire need of organizing refresher courses, short-term intensive courses in special subjects, practical training, work-shops and professional conferences at both the levels (primary and secondary) of teacher education programs. (v) If education was to meet the demand of our time and of coming decades, the organization, content and methods of teacher education must be constantly improved. (vi) Search for new education strategies and concepts should be undertaken, taking account of the special social and cultural conditions under which the school and the teachers must perform their basic functions. (vii) Since it was not possible to equip the student-teacher with knowledge and skills which would be sufficient for his whole professional life, the initial preparation for the profession in the form of pre-service education and training, should be considered only as the first fundamental stage in the process of continuous education of teachers.

Sinha. U., (1980), conducted a study titled, **'The Impact of Teacher Education Program on the Professional Efficiency of the Teachers'.**

The objective of the study was to find out the impact of teacher education program on the effectiveness in classroom teaching; teacher's competence to perform different

non-teaching roles and the attitudes of teachers toward teaching and teacher-pupil relationship.

The main findings of the study were- (i) In the sphere of professional efficiency, the trained teachers were better than the untrained teachers in the knowledge of the subjects, preparation for teaching, self-confidence, voice, pronunciation, facial expression and in actual classroom teaching taken as a whole. (ii) The trained teachers were better than the untrained teachers about the aims of the lesson, its appropriateness, its organization, the use of teaching devices, presentation, questioning, answering students' questions, the use of blackboard and other teaching aids, eliciting students cooperation and participation, and effective closure. (iii) There was no significant difference in the competence of the two groups of the teachers to manage the classroom discipline and to maintain a congenial climate for the teaching learning activity. (iv) The two categories of teachers did not differ significantly in maintaining good interpersonal relations, cooperating with the principal, doing office work, guiding students' participation in the activities of associations, committees, community life and co-curricular activities. (v) There was no significant difference between the two categories of teachers in their attitude towards the teaching profession and teacher-pupil relations.

Devi, Laxmi., (1988), conducted a study titled, **'Evaluation of the Teacher Education program of Agra University'.** The objective of the study were to- (i) To measure attitudes, values and adjustment of B.Ed. students in the beginning of the points against the attitude of student-teachers towards teaching profession in the beginning of the session, (ii) To investigate into the nature of change in the professional attitude, teachers' values and personality adjustment of the students towards the training period. The study followed the Field experiment method with the pre-test and post-test approach.

The major findings of the study were: (i) There was a low and significant correlation between the selection points and the teacher attitude scores of the student-teachers in the beginning of the session. (ii) There was a positive trend of correlations between attitude, adjustments and values. (iii) The correlation between teacher attitude and adjustment and teacher adjustment and teacher values was very low and significant. (iv) The teacher education program did not contribute towards the teacher attitude of the student-teachers. (v) The overall trend of teacher values was positive but not

significant. (vi) There was a significant gain in the case of aesthetic values but there was significant reduction in theoretical and social values.

Overview

The above mentioned studies discusses the status of the teacher education/training program and its effectiveness, in which it is revealed that there is a dire need for the content up gradation of the teachers, rigorous training and most importantly extended duration of training. It is also reflected in the study conducted by Sharma, A., (2013).One of the findings revealed that duration of the program was a hindrance in the execution of the curriculum planned. Hence, the integrated teacher education programs are the call for today's education scenario, since it provides a comprehensive knowledge of the subject matter as well as the teaching-learning theories

Hence, the findings of these studies helped the researcher to study about one such rigorous and intensive integrated teacher education program in the form of a case study.

2.5. IMPLICATIONS OF REVIEW OF RELATED LITERATURE

The researcher has undertaken a study titled, 'A Case Study of B.Sc. B.Ed. Program of Navrachana University of Vadodara'. The very reason for the inception of the 4 year B.Sc. B.Ed. program was to generate better quality of teachers with strong professional training which was not possible with the regular 1 year teacher training program. The similar research has been done by Srivastava S and Manvadriya S (2008), 'A Case Study of LokBharti, Sanosara, Gujarat, India', in which the researchers have traced out the unique features of the institute which provides the better quality of teachers with a different curriculum transaction. The aim of any educational institution is to generate better quality of teachers who can uphold the teaching as well as non-teaching activities. But somehow, it is not possible with the regular teacher training programs, as it does not ensure the professional development of teachers, as a result teachers transacts outdated information in the classrooms. The study related to the professional development of teachers has been done by Lakdawala, U.T. (1977) titled, 'The Professional Growth of Women Teachers of Secondary Schools of Greater Bombay', in which one of the findings revealed that there was not a single activity leading to professional growth performed by 50 percent

or more of the teachers. The teachers were ready to take up unique courses but they were not willing to engage in any research activity. Therefore, professional development of teachers is a great challenge which we can overcome by introducing unique programs like B.Sc. B.Ed. and Lokbharti. Considering the effectiveness of the teacher training programs several studies have been conducted in which it was found that, there is dire need of organizing refresher courses, short-term intensive courses in special subjects, practical training, work-shops and professional conferences at both the levels (primary and secondary) of teacher education programs(Sharma. M. 1982). One of the finding revealed that quite a few teacher-educators were not adequately qualified to supervise teaching practice in the subject in which they were supervising the lessons. Also the practice teaching phase was quite short as schools do not proved adequate time, resulting into a poor quality of teachers and teaching methodology (Mohan K. 1980).

Therefore we can get a clear idea from the findings of different researchers that the major problems in the field of education are- no professional development of teachers; regular teacher training programs not sufficient to generate better quality of teachers resulting into a laidback attitude of teachers towards teaching profession and no up-gradation of the teacher training institutes in terms of curriculum, methodology and practical training provided to the student-teachers. Considering all the major findings, the researcher decided to take up a case study of unique program called B.Sc. B.Ed., so that the future researchers can conduct the similar studies in order to make people aware about the unique teacher training programs apart from the regular ones.

2.6. RATIONALE

India has experienced a major transition in terms of higher education system. Currently, the trend of traditional higher education system i.e. 10+2+3 has been challenged by the newly recognized and practiced trend of 10+2+5or4, which is termed as Integrated Program.

The Integrated Program is not a new concept in other countries and now-a-days in India as well. Many reputed Institutes like IIM and IIPM have incorporated such programs, as it is a whole new concept which guarantees all-round development of students.

Such programs have taken a slow but firm entry in teacher education programs viz. B.Sc. B.Ed.; B.A. B.Ed. etc. But, how far this program has proved to be successful in

the universities of Gujarat? How is the curriculum designed? What are the difficulties faced by the functionaries? Many such questions are unanswered. Hence, the present research makes a brief attempt to answer several questions related to the Integrated Teacher Training Program in form of a Case Study of B.Sc. B.Ed. Program of Navrachana University of Baroda, Gujarat, India.

In the 21st century, all educators play a significant role in shaping the lives and careers of their students. When teaching and learning is at its best, our students, our communities; and our nation thrive. Educator preparation leaders are right to challenge themselves with the question: "What is our role in the changing landscape of 21st century knowledge and skills?" If educator preparation leaders come together to define and implement approaches that support the teaching and learning of 21st century knowledge and skills in more purposeful ways, we all benefit.

The American Association of Colleges for Teacher Education (AACTE) and the Partnership for 21st Century Skills believe new teacher candidates must be equipped with 21st century knowledge and skills and learn how to integrate them into their classroom practice for our nation to realize its goal of successfully meeting the challenges of this century.

West Virginia University – Transformational Innovation The College of Human Resources and Education at West Virginia University is gearing up to prepare educators for a global world. Responding to the immediate state and national needs for teachers prepared with 21st century skills and knowledge, the College is piloting a three-year, year-round teacher education program focused on providing a broad understanding of world regions and societies and an in-depth knowledge of pedagogy and human learning. To accomplish this, the program includes three clinical experiences: one rural, one urban; and one international. Clinical rotations, utilized so that college faculty may visit top classrooms with their students, allow immediate discourse regarding best practices. Technology, used extensively throughout the program, includes 1) web cams, SKYPE, video conferencing; and more for observation and connectivity between pre-service candidates and teacher experts world-wide; and 2) gaming, social networking, Second Life and simulation technology to provide candidates with opportunities to network as teams, hone their classroom management skills as teacher avatars, and interact virtually with special students and those for whom English is a second language. Special Education and English language learning instructional skills are embedded in the program to support

the needs of all 21st century students. Pedagogy, taught previously as separate skill sets, is combined into modules so that connectivity between content such as math and science is more apparent. The study of foreign language is encouraged. The goal is - World-ready educators, strong scholars eager to take charge of today's classrooms, in three years or less from admission to graduation. (AACTE, 2010)

The professional preparation of teachers is one of the most important social problems India is called upon to solve. The Education Commission (1964-66) too observed, 'Of all the different factors which influence the quality of education and its contribution to the national development, the quality, competence and character of teachers are undoubtedly the most significant'. An excellent education system does not happen by chance, but by knowledgeable, reflective, and socially just educators teaching a meaningful and relevant curriculum'.

If the schools are to prepare the youth with clear-cut ideals with desirable activities and attitudes the teachers must possess that clear-cut vision and must be equipped not only with scholarship but with the act of educating their pupils. The future of a younger generation depends on the quality of younger generation and this quality depends upon the quality of teachers. Unless the special measures are adopted for better teacher training programs and better quality of teachers then, not only the standard of the education but also the progress, prosperity and welfare of the nation will be threatened. In the same line, some of the findings of the studies revealed that the teachers are not adequately trained to take up the tasks related to teaching (Mohan k. 1980), which means the training imparted in the training institutes are not adequate. This issue has been reflected in one of the findings that the teacher education program did not contribute towards the teacher attitude of the student-teachers (Devi, Laxmi. 1988). Certain conclusions can be drawn from these issues - Teacher's content knowledge is poor because of the conventional one year teacher training program. Moreover, the teacher education programs are designed improperly and focus is given only to the teaching pedagogy and therefore the content knowledge of the subject matter is compromised.

Therefore, in such circumstances there is a dire need for comprehensive four-year integrated teacher training program. One of the epitomes of such program is the Kurukshetra experiment which has been mentioned earlier. The Regional colleges of Education in Ajmer, Bhopal and Mysore, experimented such programs and it has been proved successful in upgrading the teachers and teaching competencies of teachers.

Many Commissions and Policies like The Chattopadhyaya Committee Report, Kothari Commission, NCTE innovations in teacher education report have suggested the introduction of four-year integrated teacher education program and UGC after the joint meeting with NCTE has formulated the consensus report and has successfully implemented such programs in several universities and colleges. In the same line, a comprehensive action plan has been made by NCTE on recommendations of Justice Verma Commission towards the four year program of D.Ed. after the completion of XIIth standard.

In the era of perpetual professional development, the policies and commissions are not sufficient enough to ensure the formulation of such unique programs. Hence it becomes inevitable to understand the importance of such programs by studying its unique curriculum, administration etc. Hence the researcher has taken up the case study of Navrachana University of Baroda, Gujarat, which provides the integrated teacher education program called B.Sc. B.Ed. program. The program is unique and is initiated by Navrachana University of Vadodara. Hence, it contributed as a major reason for the researcher to study about this unique program in detail.

The beneficiaries of this research will be the policy makers as the findings of the research can be helpful to them in order to govern new policies related to the curriculum and administrative aspects of such programs. Also the functionaries and teachers of the programs will be benefited as they can get some important guidelines from this research as to how to carry the entire program systematically without any haste. It will be a major help for the curriculum planners to develop a curriculum with an integrated approach. Most importantly, the students will be benefited from such program as they can achieve the mastery over several disciplines along with teacher education. Therefore, the research will be helpful to the community as whole as trained teachers with vast knowledge of the subject matter and teaching pedagogy is a requirement of 21st century.

CHAPTER 3: METHODOLOGY

3.0. Introduction

Research methodology is a way to systematically solve a research problem. It is necessary for the researcher to know not only the research methods/techniques but also the corresponding methodology. Researchers not only need to know how to develop certain indices or tests, how to calculate the mean, the mode, the median or the standard deviation or chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques, are relevant and which are not, and what would they mean and indicate and why. If a study requires a methodology of specific type which is not used by the researcher then the outcomes can be misleading.

Thus, when a researcher refers to research methodology, he/she not only talks of the research methods but also considers the logic behind the methods employed, in the context of the present research study, and explains why a particular method or technique is used and why not any other. The objective is to gain insights into the phenomenon and to accurately portray the characteristics or features of the same; the research methodology chosen should facilitate the same.

There are four main features of research methodology: designing, sampling, data collection and data analysis. This chapter deals with the design of the study, sample tools, techniques used and the procedure of data collection.

3.1. Statement of the Study

A Case Study of B.Sc. B.Ed. Program of Navrachana University of Vadodara, Gujarat, India

3.1.1. Explanation of the terms

Case Study: It is a "systematic inquiry into an event or a set of related events which aims to describe and explain the phenomenon of interest. While the method is applied retrospectively, the learning is used prospectively." (Bromley, 1990, p. 302).

By concentrating on a single entity or case (i.e. one child, one classroom, specific programme), the researcher is able to uncover the distinct characteristics of a phenomenon.

B.Sc.B.Ed. Program: It is an integrated four-year teacher education programme in Navrachana University, Vadodara, Gujarat, India.

3.2. Research Questions

Why was the B.Sc. B.Ed. Program introduced in Navrachana University?

How was the B.Sc. B.Ed. Program started?

What are the infrastructural facilities of the B.Sc. B.Ed. Program?

How is the administration of the B.Sc. B.Ed. Program of Navrachana University?

How is the curriculum designed and transacted in the Program?

What are the innovative aspects of the Program and how are these implemented?

What is the profile of the functionaries of the Program?

What are the perceptions of the functionaries, teachers and students about the Program?

How are the students going to benefit from the curriculum of the B.Sc. B.Ed. program?

3.3. Objectives of the Study

In order to address some of the research questions, the following objectives are designed for the study:

1. To study about the following aspects of B.Sc. B.Ed. Program of Navrachana University-
    a. Objectives, Inception and Evolution of B.Sc. B.Ed. program.
    b. Profile of the functionaries of B.Sc. B.Ed. program.

2. To study the following aspects of B.Sc. B.Ed. program of Navrachana University-
    a. Infrastructural facilities
    b. Administrative aspects
    c. Curriculum and its transaction

3. To study the perceptions of the Functionaries, Academic Advisory Board members and Students (Present and former) on the B.Sc. B.Ed. Program, Navrachana University.

3.4. Methodology of the Study

To achieve the objectives, a Case Study was conducted. This type of study allows an intensive analysis of an individual case; it is a methodological approach that allows the use of various instruments to understand the case in all its details.

3.5. Sample of the Study

Purposive sampling is generally used in a Case Study.

The sample of this study included - 10 Functionaries (teachers and a coordinator), 2 Academic Advisory Board members, 20 Students (Present and former) of B.Sc.B.Ed. Program of Navrachana University of Vadodara, Gujarat, India, for the academic years 2009-15.

3.6. Preparation of the Tool

To elicit the required data, the method of triangulation was employed, that is using a number of research methods to draw together data from multiple sources in order to comprehend and confirm the findings. Thus, the tools for the Study were designed in accordance with the design of the study.

The following tools / instruments were used to collect data for the Study -

- Open ended and closed ended questionnaire
- Checklist
- Semi-structured interviews
- Telephonic interviews
- Document analysis.

For objective 1, ***documentary analysis*** was done. ***Semi Structured Interview*** was also conducted with the Chairperson of the University to know about the inception of the program and to verify the data obtained from documentary analysis. (List of questions are attached in Appendix 7)

In order to study the ***infrastructural facilities*** pertaining to B.Sc. B.Ed. program (Objective 2A), a checklist was prepared. It consisted of various aspects like – classroom facilities, library facilities, computer facilities, science laboratory and Language laboratory. A copy of checklist used in the study is enclosed in Appendix 4.

In order to study the ***administrative aspects*** of B.Sc. B.Ed. program (Objective 2B); a questionnaire was prepared with both open ended and closed ended items. It included

various aspects related to the administration of B.Sc. B.Ed. program. A copy of questionnaire used in this Study is enclosed in Appendix 5.

In order to study the ***curriculum and its transaction*** (Objective 2C), a questionnaire was prepared with both open ended and closed ended items. It included various aspects related to how the curriculum was made and transacted in the classrooms and the uniqueness of the curriculum and its transaction. A copy of questionnaire used in this Study is enclosed in Appendix 6.

In order to study the ***perception*** of the Functionaries, Academic Advisory Board members and Students (present and former) on the B.Sc. B.Ed. Program, (Objective 3), a semi-structured interview schedule was prepared. The questions in the semi-structured interview schedule were framed differently for the functionaries (Teachers and Coordinator), Academic Advisory Board Members and present and former students of B.Sc B.Ed. program. List of these questions is enclosed in Appendix 7

In the process of preparation of the tools, major focus was on the utility of the tools as per the different objectives of the Study. The tool got structured after passing through different stages of validation.

3.7. Validation of the Tool

In the second stage of preparation of the tool, the prepared tool was presented to five experts who were the professors of B.Sc. B.Ed. program (List enclosed in appendix 3).

Prior permissions were taken from the experts and the tool attached with a confirmation letter specifying the title and the objectives of the Study were presented to them (enclosed in appendix 2). The experts were requested to give their opinion and suggestion regarding the language of the tool (its lucidity, simplicity and correctness) and the content validity of the tool (how relevant was the information to the objectives under consideration).

Various suggestions were received from the experts, which were related to simplifying the language of questionnaire, adding few more aspects to substantiate the Study. Verbal as well as written comments were incorporated to modify the tool before proceeding ahead with the data collection procedure.

3.8. Data Collection

This section discuss about the manner in which data was collected in the field.

Stage1: Documentary Analysis

In order to collect information related to the objective 1 (Inception & evolution as well as profile of the functionaries of the B.Sc. B.Ed. programme) various documents pertaining to B.Sc. B.Ed. programme were collected and analysed.

Stage 2: Permission for Tool Administration

Access to the teachers, students and the coordinator was gained. Also, the permission for tool administration was attained (copy of permission letter is enclosed in appendix 1).

Stage3: Tool distribution.

Questionnaires were given to the teachers of B.Sc. B.Ed. programme.

Stage 4: Observation of Infrastructural Facilities.

Observational checklist was used by the investigator by visiting the university to acquire the data related to infrastructural facilities.

Stage 5: Data Collection

This stage was that of the actual data collection. It took several visits to the sample place to get the duly filled questionnaires from the teachers.

Stage 6: Conducting of the Semi-structured Interview

This phase involved the personal interaction with the teachers and Coordinator of B.Sc. B.Ed. program. Appointments were fixed at different dates for each teacher, in order to avoid any clash. The semi structured interview was then conducted as per schedule of the appointment taken.

Stage 7: Telephonic Interview with former students

In order to conduct telephonic interview of the former students of B.Sc. B.Ed. program, prior appointments were fixed with them on phone as per their convenience. The telephonic interviews with the former students were conducted on phone as per the schedule of the appointment.

Stage 8: Telephonic Interview with present batch of students

The investigator met present students of B.Sc. B.Ed. programme in the campus itself and took an appointment for the interview. Semi-structured interview was conducted with the present students in the hostel as per the prior discussion.

Stage 9: Telephonic Interview with Academic Advisory board members

Semi-structured interview with the members of Academic Advisory board was conducted. Semi-structured interview with the Chairperson of Navrachana University was also conducted.

It took 4 visits and some telephonic conversations for the investigator to get the proper responses for the semi structured interview. This gives a brief idea of the efforts made by the investigator to get authentic data for the Study.

3.9. Procedure of Data Analysis

The data procured from various documents was analyzed qualitatively employing the technique of content analysis. The data obtained from the checklist was analyzed using the techniques of content analysis, and was interpreted as per the different criteria mentioned in the checklist. The information was read repeatedly, and was categorized into two categories for the interpretation of the data. The data obtained from the open-ended and closed-ended items in the questionnaires were analyzed using the technique of content analysis and percentage analysis (wherever required); the responses were further placed thematically in order to enable the interpretation of the data.

The data obtained from the semi-structured interview was analyzed using various steps. Firstly, write-ups were read carefully and notes were made. Then observations were bifurcated into interpretive categories. Basic themes were then determined based on the responses made by the respondent. The newly determined themes were then fixed into the pre-decided themes. Percentage and frequency analysis was done for the semi-structured interview conducted with the students (present and former)

Thus, in the present chapter discussion about the methodology of the present study has been presented. The tools prepared and implemented in the field generated a lot of data needed for the present study. The analysis and interpretation obtained from this data is presented in the next chapter.

Table 1: Overview of the data collection and analysis as per different objectives

Sr. No	Objectives	Nature of Data	Source of Data	Tools	Data Analysis
1.	Objective 1 – To study- The Objectives; Inception and Evolution of the program	Qualitative	Program related documents	Documentary Analysis	Content Analysis
	Profile of the functionaries of B.Sc. B.Ed. program	Qualitative	Teachers	Semi Structured Interview	Content Analysis
2.	Objective 2 –To study - Infrastructural facilities	Qualitative	Observation	Observational Checklist	Content analysis
	- Administrative Aspects	Qualitative	coordinator, and subject teachers	Open-ended & closed ended questionnaire	Content analysis
	- Curriculum and its transaction	Qualitative	coordinator, and subject teachers	Open-ended & closed ended questionnaire	Content analysis
3.	To study the perception of functionaries (teachers and coordinator)	Qualitative	coordinator & Teachers	A Semi-Structured Interview	Content Analysis
	Academic Advisory Board Members	Qualitative	Members of Academic Advisory Board,	A Semi-Structured Interview	Content Analysis
	Students (former and present)	Qualitative + Quantitative	present and former students	A Semi-Structured Interview	Content analysis + Percentage analysis

CHAPTER 4: DATA ANALYSIS

4.0. Introduction

The methodology described in the previous chapter provided the baseline for data gathering. This chapter will focus on the analysis and interpretation of data that was collected for this Study. According to De Vos (1998:203), data analysis entails that the analyst break down data into constituent parts to obtain answers to research questions and to test the hypothesis. The analysis of research data does not in its own provide the answers to research questions. The purpose of interpreting the data is to reduce it to an intelligible and interpretable form so that the relations of research problems can be studied and tested, and conclusions drawn. On the other hand, when the researcher interprets the research results, he/she studies them for their meaning and implications (De Vos, 1998:203). Hence, it is necessary for the researcher to analyze and interpret the raw data to structure it sequentially and critically.

4.1. Analysis and interpretation of data obtained from the documentary analysis

The design adopted for the present study was 'Case Study'. Various documents related to B.Sc. B.Ed. Program were read and analyzed carefully, in order to get information related to the inception stage of B.Sc. B.Ed. Program, its evolution and detailed information of the functionaries of B.Sc. B.Ed. Program.

4.1.1. Analysis related to Objective 1

The objective was -

To study about the following aspects of B.Sc. B.Ed. Program of Navrachana University-

a) Objective, Inception and Evolution of B.Sc. B.Ed. program.
b) Profile of the functionaries of B.Sc. B.Ed. program.

4.1.1.1. Analysis of data related to the objective, inception and evolution of B.Sc. B.Ed. Program

Objective -

The objective of initiating a Program of this nature was recorded in the documents as follows –

The B.Sc. B.Ed. Program at NUV is a 4 year Integrated Science Teacher Preparation Program designed to meaningfully integrate content with pedagogy and prepare future Science Teachers with a science background together with specific training in science teaching related skills to engage their students in future in meaningful science learning.

The vision for the Program was in keeping with the vision of the University i.e.

- To evolve as a University of unique Institutions for pursuing '*integrated studies'* in education, educational development and other fields of studies.
- To create centers of excellence for providing knowledge, education, training and research facilities of high order in the broad areas of studies i.e. education, education technology, engineering, humanities, languages, cultural studies, laws, life sciences, health and hygiene related disciplines, physical sciences and social studies.
- To provide education, training and research facilities for integrating and continuing education for such broad areas of studies, pure or applied, at undergraduate, post graduate, research and doctoral levels, in such manner that they fulfill aspirations and needs, vocational or otherwise for current and future generation of students.

The University, in this endeavor, would provide opportunities comparable to international standards for pursuit of studies of education and educational development and prepare predominantly educational personnel capable of excellent teaching, research as well as extension activities. Towards this goal, the University would evolve ways and means to create, sustain and enrich, when necessary, required conditions and infrastructure; attract individuals of commendable abilities and inclinations for pursuing integrated studies in education and other fields of studies both as students and staff; evolve academic Programs with innovativeness and field relevance in the changing national and international contexts at various levels-graduate, post graduate and doctoral levels, and also encourage and support research;

develop into a poignant resource base for all those concerned with and are active in educational understanding and operations.

Thus, the B.Sc. B.Ed. program was envisioned as a unique effort to improve the quality of teacher education.

Inception and Evolution of the B.Sc. B.Ed. Program

The data for this objective was procured from the documents related specifically for the B.Sc. B.Ed. Program.

Navrachana University had been established under the aegis of Navrachana Education Society (NES). The Navrachana University was incepted on 24th July, 2009, with the objective of creating an internationally bench marked Institution of Higher Education. This University was sanctioned under the Gujarat Act no.8 of 2009 dated 7th July, 2009.

Navrachana University offers undergraduate, postgraduate and Doctoral Programs in the fields of Liberal Arts, Humanities, Sciences and Commerce under the four schools-

- School of Science and Education
- School of Environmental Design & Architecture
- School of Engineering and Technology
- School of Business and Law

About Navrachana Education Society (NES)

Navrachana Education Society (NES), Vadodara, Gujarat is a registered charitable trust established in 1965, managed by a Board of Trustees comprising eminent educationists, philanthropists, and administrators. NES is acclaimed for its achievements, having imparted, through its Schools, quality education for nearly four decades, to the children of Vadodara City, Gujarat.

Navrachana Education Society believes in and practices through its various institutions the principles and fundamental duties enlisted in Article 51(A) of the Constitution of India, promotes Holistic Education and has set benchmarks of excellence in school education at the national level.

The NES Institutions are professionally managed by the NES Executive Committee vastly experienced in administration, technology aided learning and education

management. A significant feature of NES is the multiplicity of concerns as exhibited by diversity in the institutions listed below:

- Navrachana School, affiliated to Central Board of Secondary Education, established in 1967.
- Navrachana Vidyani Vidyalaya, affiliated to Gujarat Secondary Education Board, established in 1999.
- Navprerna School, affiliated to National Institute of Open schooling, established in 2002.
- Navrachana International School affiliated to International Baccalaureate, established in 2003.
- Navrachana College of Education, affiliated to SNDT Women's University, Mumbai, established in 2004.
- Navrachana Sports Academy, established in 2005.
- Navrachana Eklavya Model Residential School, Vejalpur, a tribal school adopted by NES to run as a model school in 2007.
- Navrachana Language Academy, established in 2008.

NES, which had been providing quality education since the last few decades via its educational Institutions had long been concerned with the present status of Teacher Education in the country especially keeping in view concerns and imperatives that had emerged in the light of changing national development goals and educational priorities and thus, espoused the need for the restructuring of teacher education programs, not merely implementation methods but the basic premises or the 'beliefs' that defined Teacher Education Programs in the country.

Via the B.Sc. B.Ed. program, a system was proposed wherein the general and professional elements of the discipline could be pursued concomitantly over an extended period of time (4 years) and the same may be pursued post senior secondary education (H.S.C). The proposed new vision for the teacher education system would help to create teachers with systematic and intensive training and reflective practitioners who would have developed all those requisite qualities to touch the lives of hundreds of millions of the school going population.

Despite having acknowledged that the *professional preparation of teachers was crucial for the qualitative improvement of education* (Kothari Commission, 1964-66), very few concrete steps had been taken in the last few decades to operationalize this.

This concern for the quality of teacher education inspired the inception of the B.Sc. B.Ed. Program which then became the flagship program of Navrachana University under the School of Science and Education in the year 2009.

As preparatory effort for the designing of this unique program, a Curriculum Core Group, a Subject Experts' Group and an Academic Advisory Board was constituted at the very beginning of the academic year in 2009, which comprised of Experts in the field of Science and Education (list enclosed in appendix 8), and which helped to developed a comprehensive Curriculum Framework for the B.Sc. B.Ed. program. For a complete detailing of the Program, separate faculty for each Subject was appointed at the very beginning of the academic year i.e. June, 2009. The Curriculum Core Group provided a month long orientation to the Faculty on integration among sciences and between Science and Pedagogy through varied interactive and hands-on experiences. Members of the Core Committee continue to provide rich inputs to the Faculty till date.

The B.Sc. B.Ed. program commenced in the academic year 2009-10 and was hailed as an innovative teacher education program.

4.1.1.2. Analysis of data related to Profile of the functionaries of B.Sc. B.Ed. program

The functionaries include the teaching Faculty and the administrator (Coordinator) of the program, who looked into the transaction of the curriculum as well as the overall functioning of the program.

Most of the teaching Faculty of the B.Sc. B.Ed. Program has a dual degree in Science as well as in education, which was an essential requirement for the curriculum to be transacted in an interdisciplinary manner as envisaged. In order to provide rich disciplinary inputs, faculty from the School of Engineering and Technology of Navrachana University were also invited to transact the curriculum. (List of the functionaries of B.Sc. B.Ed. program is enclosed in appendix 9.)

In addition to the regular faculty, a number of visiting faculties were invited to conduct sessions for the self development courses. These were experts in their own

disciplines and their inputs were vital for the co-curricular inputs for the students of the program.

4.1.1.3. Interpretation of Objective 1

The professional competence of a Teacher is a major determinant of the 'quality' of education and this in turn depends on the effectiveness of their education and training. There is ample truth in the oft repeated statement of National Policy of Education (NPE-1986) that no society can rise above the level of its teachers.

Unfortunately, our Teacher Education programs continue to train teachers to adjust to the needs of an education system in which education is seen as the transmission of information and learning reproduced from textbooks. Consequently, such programs of teacher preparation lead to unsatisfactory quality of learning in schools and eventually impact the overall quality of education.

The B.Sc. B.Ed. Program was initiated as a response to the continuing poor quality of teacher education. ***The Chairperson*** of NES identified a dire need for the up gradation of teacher competencies, skills and attitudes, which might not be accomplished through traditional one year teacher training programs. Hence, the ***Chairperson*** reflected upon the need for introducing this integrated teacher education Program.

It could also be understood from the data collected that being a new program with innovations, the faculty was guided from the very beginning which was a crucial input to the conducting of the program. The curriculum core committee not only framed the innovative curriculum with an interdisciplinary context, but they also guided the teachers about its transaction, and special inputs to be provided.

The transaction of this innovative curriculum necessitated a teaching faculty with dual degree in Science as well as Education. The identification of such teachers made the planning and implementation processes of the curriculum committee successful. Considering the profiles of the functionaries of B.Sc. B.Ed. Program (enclosed in appendix 9), it can be derived that the students were taught by teachers having dual degrees as well as faculty having specializations in their subjects. Hence, the students were taught by faculty having knowledge of both the discipline and the associated pedagogic practices.

4.2. Analysis and Interpretation of data obtained from Checklist and Questionnaire

The checklist was used by the investigator as an observational tool to get the information about the infrastructural facilities provided, whereas questionnaires with open-ended and closed ended items were administered on the teachers and Coordinator of the program to know more about the administrative aspects and curriculum and its transaction.

4.2.1. Analysis related to Objective 2

The objective was

To study the following aspects of B.Sc. B.Ed. program of Navrachana University-

- Infrastructural facilities
- Administrative aspects
- Curriculum and its transaction

4.2.1.1. Analysis of data related to the Infrastructural facilities of B.Sc. B.Ed. program.

The data acquired from the observational checklist related to the classrooms facilities were analyzed as follows:

- **Classroom facilities.**

For a brief period the University was situated in a premise close to where the University is situated now. However, even in the old premise, there were well designed lecture halls, science laboratories and a library for the smooth conducting of the curriculum. The new University campus was designed keeping in mind a number of new programs and the resources that would be required for these subjects.

The data collected with respect to resources for B.Sc.B.Ed. Program revealed that - There were adequate numbers of classrooms. Each classroom was designed and equipped with the modern teaching facilities like complete terminals with internet, LCDs, Slide, Projectors, roll-down screens, green boards and podium for faculty and public address system. The unique feature of the classrooms was the circular seating arrangement for discussions.

These mini laboratories were spacious enough, well lit, well ventilated and accommodated with spacious seating arrangements to facilitate proper teacher-student interaction. The class rooms' ambience had taken a modern look with swiveling chairs and wooden tables. It could accommodate 50-100 students and was available for conducting regular orientation Programs like extension lectures, guest lectures, and personality development classes.

- **Library facilities**

The data acquired from the observational checklist related to the library facilities of the University are as follows:

The Library had separate book racks for each program as per the different subjects. Journals and magazines were placed separately for easy and ready reference. Thesis and dissertations were placed separately as per different sections. For B.Sc. B.Ed. program; books related to the Education as well as Science were available in plenty. Moreover, a whole section comprised of the books related to teaching of Science.

The library comprised of huge resource base of –

a. 12000+ books, 81 Print National/ International Periodicals and Journals (list of print journals/periodicals specifically related to B.Sc. B.Ed. Program is enclosed in Appendix 10),
b. 2000+ Online Periodicals /Journals (IMC Package) (IESTC Package),
c. 1400+ Electronic Media (CDs / DVDs),
d. 130+ Thesis & Dissertations,
e. 3000+ Bound Journals, 8 Newspapers and Previous year's examination papers.

The data related to the available library resources was verified by interacting with the University Library authorities.

- **Computer Laboratory**

The data acquired from the observational checklist related to the Computer lab of the University are as follows:

The University was technologically advanced, in terms of catering to the students with projection system, podium attached PCs in each and every class, wall PCs in corridor, free Wi-Fi facility, etc. Hence, the students had ample resources for their curricular assignments. Additionally, the University had a well equipped central computing facility in computer laboratories (2). Apart from a range of routine and

special software, the computer labs had the latest operating systems & Wi-Fi internet facilities.

The University had two laboratories for IT & Computing, with 60 sharp Dell PCs, and an array of wireless internet and LAN servers.

- **Science Laboratories**

The data acquired from the observational checklist related to the Science Laboratories of the University were as follows:

The University had well developed laboratories for Physics, Chemistry and Biology subjects. Each laboratory was equipped with sufficient equipments, apparatus, specimens and computerized charts as per the requirements of the subject. The laboratories were environmental friendly and all the necessary safety measures had been taken while designing the laboratory.

- **Language Laboratory**

The data acquired from the observational checklist related to the Language laboratory of the University were as follows:

The Language Lab was equipped with the latest Language based software. Language lab played an important role for the students of the B.Sc. B.Ed. program considering their vernacular background. These students were given special laboratory sessions to enhance their Listening, Speaking, Reading and Writing skills.

In order to develop and enhance LSRW skills, techno lessons were designed. Standardized software called 'The Ore Digital Language Learning' was used in the language laboratory for all the programs.

For B.Sc. B.Ed. program, considering their difficulties related to pronunciation, phonetics was the special area which was taken care of.

The data related to the software used, the lesson plans followed and the special concerns for the students of B.S. B.Ed. program was verified by interacting with one of the faculties looking into the transaction of the language learning.

4.2.1.2. Interpretation of data related to infrastructural facilities of B.Sc. B.Ed. Program

As per the data analyzed, it was found that the resources and facilities provided to the students of the program were done keeping in mind the special nature of the program and the inputs that would be required to understand the disciplinary concepts as well as the need to transact these effectively as future teachers. In this reference, each and every resource was crucial both for the understanding of the disciplinary concept and then its effective transaction.

Students would have to be familiar with the latest gadgets available in schools today and the University had made the necessary provisions so that students understand them and their judicious application. The computer facility, along with wireless internet and LAN servers was provided not only in the computer labs, but also in the Library, classrooms and in the corridors. Similarly, apart from the formal seating arrangement, the round table seating arrangement for small group discussions was also made. The implementation of theory and practice/experimentation was enhanced due to the well-equipped science laboratories and the vast library resources.

It could be interpreted that the facilities were designed considering various learning styles of the students. For the verbal-linguistic learners, huge resources of national and international journals are provided. The visual-spatial learners were catered with different electronic media as a learning resource. The large corridors and other open spaces were appropriate areas for the self development courses and extra mural activities and other hands-on activities.

4.2.1.3. Analysis of data related to Administrative aspects of B.Sc. B.Ed. Program

1. Who were the members of Academic Advisory Board of B.Sc. B.Ed. Program?

As per the responses given by the teachers , the program was designed by a core team of eminent educationist and scientists, and was advised by an Academic Advisory Board who designed the program and provided the vital inputs on an ongoing basis to keep it up-to-date and relevant to the emerging needs of science education. (The list of members of Academic Advisory Board is enclosed in Appendix 11).

2. What were the criteria for giving admission to B.Sc. B.Ed. Program?

As per the responses given by the teachers, the admission criteria were as per NCTE regulations for Teacher education programs. A candidate who has passed a recognized standard XII Higher Secondary Certificate (10+2) Examination in Science stream, or an equivalent examination (including IGCSE A-Level and IB diploma), with minimum 45% marks (in Science and Mathematics) is eligible for admission to the program. This was verified from the official document of B.Sc. B.Ed. program.

3. How was the mode of assessment?

In response to this question, 4 out of 10 teachers responded that the mode of assessment was innovative, whereas 3 of them responded that the mode of assessment was traditional, and the remaining 3 teachers responded that the mode of assessment was both traditional as well as innovative. Hence, more number of respondents responded that the assessment was innovative. The respondents in support of the innovative assessment practices further responded that more emphasis was on formative assessment to shape the learning and achieve designed learning outcomes. The program followed continuous and comprehensive evaluation scheme.

This was verified with the official documents and records of the B.Sc. B.Ed. program.

4. How was the evaluation system of B.Sc. B.Ed. program?

As per the responses of the teachers, Seven Points Scale grading was followed. At the end of a semester, each student is awarded a letter grade in each course based on the performance in the Heads of Passing of the course. This grade is decided normally by giving a weightage of two-third to the in-semester and practical examination grades and one-third weightage to the end-semester examination grade. These letter grades carry qualitative equivalents as well as quantitative equivalents on a seven point scale (0-6) as given below. Grade of C or better indicates Pass; grade of D, E and F indicates Fail. The grade points are obtained by multiplying the numerical equivalent by the credits.

Table 2: Seven Points Scale Showing Quantitative and Qualitative Equivalents

Letter Grade	Qualitative Description	Corresponding Points	Grade Point Average Range
O	Outstanding	6	5.50 - 6.00
A	Very Good	5	4.50 - 5.49
B	Good	4	3.50 - 4.49
C	Average	3	2.50 - 3.49
D	Below Average	2	1.50 - 2.49
E	Poor	1	0.50 - 1.49
F	Fail	0	0 - 0.49

5. Does the program get any Government aid? Does it accept Government scholarships?

All the teachers responded that, Navrachana University, being a Private University, did not receive any Government aid for the conducting of any of its programs. However, as per the responses given by the respondents, the students were eligible for post-matric scholarships for SC/ST (Tribal department) provided by the State Government. This aspect was verified while conducting semi-structured interview with the students and functionaries of the Program.

6. Were adequate facilities provided to ensure innovative methodologies? If yes, please justify.

As per the responses given by the respondents, 9 out of 10 teachers responded that adequate facilities were provided to ensure innovative methodologies. They further responded that facilities like adequate books, projection system in all classes, physics, chemistry, biology labs, computer labs, language labs, small classrooms with unique seating arrangements etc, ensured innovative methodologies.

Whereas, only 1 out of 10 teachers responded that the facilities were provided to some extent only. Justifying it, they added that some of the facilities like projection system, etc, were provided but not the essential print resources needed to enhance learning. However, data was crossed-checked with the observational checklist used to study the infrastructural facilities, and it was found that the library comprised of a huge print resources and e-resources.

7. How did you ensure enrichment in academics?

As per the responses given by the respondents, the enrichment in academics was ensured through following academic practices:

The Program had a unique feature – the students who had just passed out of Std.12 examinations conventionally belonged to either the Math or the Biology group and consequently would have studied the Biology or Math group of subjects only in depth.

The Program however, made it mandatory that in the initial years, students would have to study all the courses regardless of the group they had earlier chosen. The rationale was that Science teachers must have a broad based disciplinary knowledge which would help them as future teachers. After the initial 'compulsory subject' semesters and having ensured that a foundation was laid wherein both Math and Science content had been taught, students were only then permitted to take up specialization of their chosen subject.

Other components which gave them added exposure were -

- Various visits (industrial visits, institutional visits, field visits, etc.)
- Hands on experience (in laboratory, practice teaching, simulation and integration phases)
- Expert lectures
- Research projects
- Presentations
- Different teaching methods like – team teaching, cooperative learning, classroom discussions, debate, drama, role-play, Video lectures, Case study, etc.
- Documentary/movie making, model making, poster making
- Extra mural activities – photography, film appreciation, dramatics, theatre, singing, dance, calligraphy, etc for related learning

All the above mentioned practices were important for holistic learning.

8. Time Management

As per the responses given by the respondents, various components were incorporated within the timings of 9:00 am to 5:00 pm through a well designed timetable and academic calendar. The time was divided into pre-lunch and post-lunch sessions,

which was further divided into theory hours. So, assembly, laboratory sessions, classroom teaching, extra murals etc, were arranged as per the requirements.

9. What challenges were faced in administration of B.Sc. B.Ed. Program?

As per the responses given by the respondents, various challenges faced in the administration of B.Sc. B.Ed. Program were:

- The most important challenge for the Coordinator of the program was that too many human and non human resources had to be judiciously merged for that integrated effect.
- It was challenging to make both the faculty and students understand the concept of the integrated Program. The training given in the initial months helped to clarify many concerns that were raised.
- Acceptance for the Program was only gradually building up both within and outside the University and thus the number of students enrolled were not too many.
- Also, students had to study additional academic components and it was a challenge to raise their levels to acceptable standards.

4.2.1.4. Interpretation of data related to Administrative aspects of B.Sc. B.Ed. Program

From the data analyzed, following interpretations can be made:

In order to make sure that the academic criteria were as per NCTE norms, and for the overall quality of the Program, an Academic Advisory Board was appointed. They oversaw the conducting of every aspect of the Program. Since the Academic Advisory Board gave timely academic updates, the quality was not compromised.

The students from Scheduled Tribe formed a majority in the B.Sc. B.Ed. Program and availed the post-matric scholarship provided to them by the State Government.

The functionaries of the Program ensured that the students got all the facilities and also ensured enrichment in academics through various types of inputs. The low enrollment of students was yet another difficulty faced by the Program. The reasons that can be interpreted for low enrollment are slow acceptance of a ‘new’ concept, less preference for teaching as a profession in Gujarat and also the extended duration of the Program. The most important challenge for the Coordinator of the program was that too many human and non human resources had to be judiciously merged for the

integrated effect. Also, students had to study additional academic components and it was a challenge to raise their levels to acceptable standards while parallelly pursuing their specialization subjects.

4.2.1.5. Analysis of data related to the curriculum and transaction of B.Sc. B.Ed. Program

1. Who were involved in designing the curriculum of B.Sc. B.Ed. Program?

As per the responses given by the respondents, the integrated curriculum had been designed by a core team of eminent educationists and scientists, subject experts (the Curriculum Core Committee), the Coordinator and the faculties. (List of members of Curriculum Core Committee is enclosed in Appendix 8). The names of the members of Academic Advisory Board were verified through the official document of the B.Sc. B.Ed. Program.

2. What factors were considered while designing the curriculum of B.Sc. B.Ed. Program?

As per the responses given by the respondents, various factors which were considered while designing the curriculum of B.Sc. B.Ed. Program were:

- The Program was an integrated science teacher education Program; hence whatever components were designed would have to be the amalgamation of both Science and education.
- The curriculum would have to be designed keeping in mind the expectations of the school from the science teachers.
- Subject Mastery should not be compromised although additional components had been introduced in the Program. The investigator confirmed the data by referring to the credit structure and its allotment to various subjects.

Thus the Program was designed to -

- Provide balanced pursuit of Science and Mathematics;
- Provide an understanding of the educational context in India with a global perspective;
- Enable study in life-related, field and practice related ways without losing the academic rigor of the subjects;

- Emphasize development of positive attitudes in incumbents;
- Be Context oriented, flexible, dynamic, learner relevant;
- Be flexible -

  - in delivery, with sensitivity to local, national and global concerns.
  - in entry and exit channels for pursuing advanced study in both disciplinary and professional aspects .
  - in Learning .
  - in assessment modes.

- Emphasize self learning, cooperative learning, ample on-field and hands-on learning experiences which are self evolved wherever possible, rather than mere classroom based teacher designed learning.
- Emphasize ICT based learning.
- Provide scope for linear integration and diversification into Post Graduate programmes.
-

3. Please mention the details of the Program structure (credit structure) of B.Sc. B.Ed.

As per the responses given by the respondents, the credit structure of the Program is explained as below:

Table: 3 Credit Structure of B.Sc. B.Ed. program

SUBJECT	CREDITS
Language	12
Education	72
Self Development	24
Research	6
Science and Maths	172
TOTAL CREDITS	**286**

The following is the graphical presentation of the credit structure of B.Sc. B.Ed. Program.

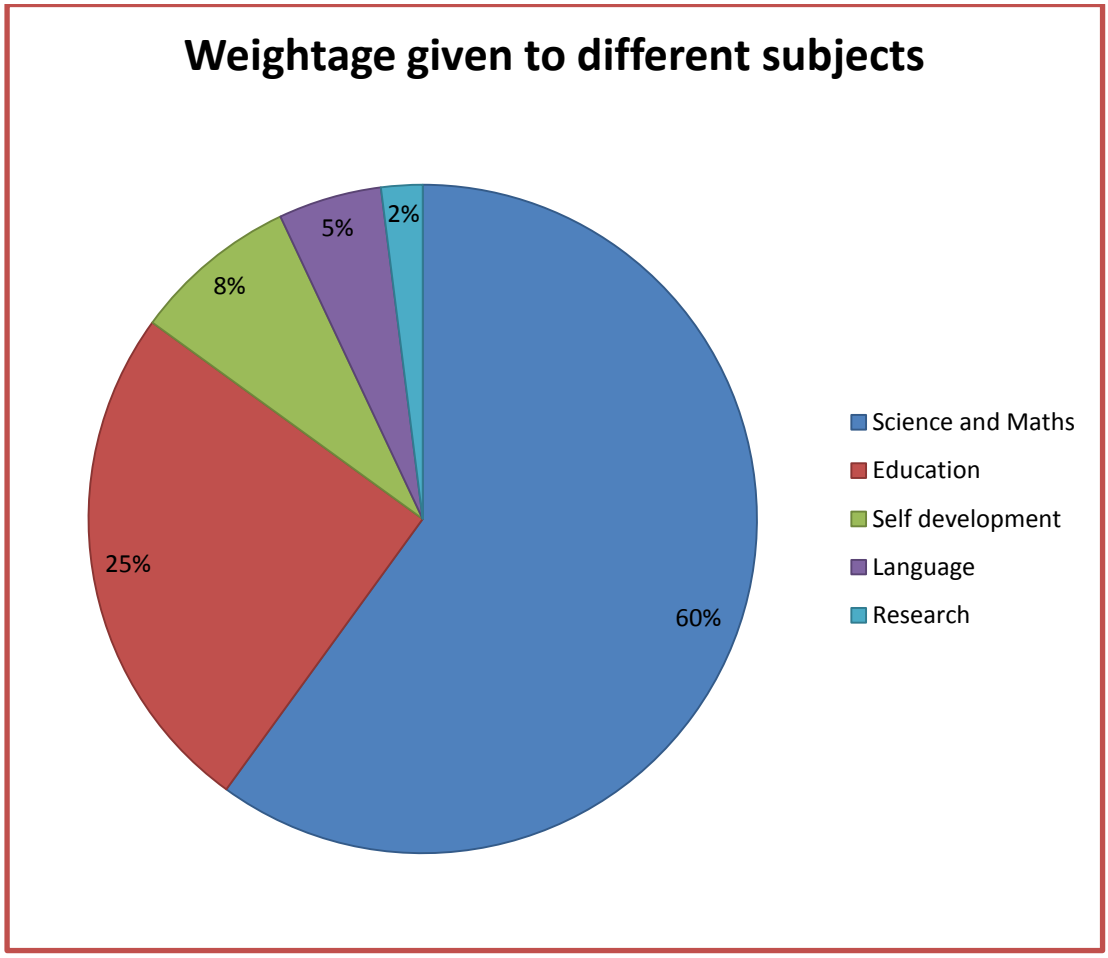


Figure: 2 Credit Structure of B.Sc. B.Ed. program

Table4: Credit Distribution (Semesters I – VIII)

Semester																	
I		II		III		IV		V		VI		VII		VIII		Total	
Cc	Cr	Cc	Cr	Cc	Cr	Cc	Cr	Cc	Cr	Cc	Cr	Cc	Cr	Cc	Cr		
Section I – Developing Language Proficiency												*Total Credits*					*12*
L11	4	L21	2	L31	2					L71	2	L81	2			12	
Section II – Understanding Science												*Total Credits*					*172*
BZ11	6	BZ21	6	BZ31	6	BZ41	6	B51	8	B61	8	B71	6	B81	6	36	
												B72	6	B82	6		
												B73	6	B83	6	76	
								Z51	8	Z61	8	Z71	6	Z81	6	36	
												Z72	6	Z82	6		
												Z73	6	Z83	6	76	
C11	6	C21	6	C31	6	C41	6	C51	8	C61	8	C71	6	C81	6	36	
												C72	6	C82	6		
												C73	6	C83	6	76	
P11	6	P21	6	P31	6	P41	6	P51	8	P61	8	P71	6	P81	6	36	
												P72	6	P82	6		
												P73	6	P83	6	76	
M11	4	M21	4	M31	4	M41	4	M51	8	M61	8	M71	6	M81	6	44	
												M72	6	M82	6		
												M73	6	M83	6		
												M74	4	M84	4	76	
Section III – Developing a Vision for Educational Practice												*Total Credits*					*72*
E11	4	E21	4	E31	4	E41	5	E51	5	E61	6	E71	6	E81	6		
E12	4	E22	5	E32	4	E42	6	E52	4	E62	3	E72	4	E82	2	72	
Section IV – Experiences for Self Development												*Total Credits*					*24*
D11	4	D21	4	D31	4	D41	4	D51	4	D61	4					24	
Section V – Research												*Total Credits*					*6*
												R71	6			6	
Grand Total																	
	38		37		36		37		37		39		36		26		286

Cc –Course Code, Cr – Credits

L – Language, BZ – Biology, B – Botany, Z – Zoology, C – Chemistry, P – Physics, M – Mathematics,

E – Education, D – Self Development, R – Research.

Course Coding (L11 – Language, Semester 1, Course 1)

For Science Subjects: Semester I, II, III and IV = All subjects compulsory.

Semester V and VI = Elective in any three subjects (PCM, CBZ …)

Semester VII and VIII = Specialization in any one subject.

Semester VII and VIII includes Research. ,

Semester VII and VIII Mathematics specialization has additional 4 + 4 credits.

In Semester I, II, III and IV, all subjects were compulsory (Biology, Physics, Chemistry, and Mathematics);

In Semester V and VI, any three subjects were to be chosen as electives. For example: Physics, Chemistry, Mathematics or Chemistry, Biology, Zoology.

Semester VII and VIII included a research project. For those who had selected mathematics as a subject of specialization, additional 4+4 credits had to be studied. The data was confirmed with the official document of the B.Sc. B.Ed. Program.

4. What innovative measures were typical to four year Program?

As per the responses given by the respondents, the innovative measures were-

- Amalgamation of disciplinary and pedagogic knowledge
- Research in Semester VII and VIII. The students conducted research on issues concerning immediate Community. The title of the studies were- 'A study on the water quality of two ponds near Navrachana University, Vadodara' and 'A comparative study of anthropogenic influence on physico - chemical characteristics of soil in and around vasna and bhayli ponds'.
- Interdisciplinary aspects like studying Language, ICT etc. meaningfully incorporated
- Extra-Mural subjects and other activities for self-development.

The data was confirmed while conducting semi-structured interview with teachers of the program.

5. What were the practical aspects covered under B.Sc. B.Ed. Program?

As per the responses given by the respondents various practical aspects covered were-

- Industrial visits/field trips for extensive practical exposure
- Institutional visits to view and document exceptional practices in teaching and learning
- CSR visits to various centers of children with learning disabilities to understand new concepts such as inclusive education
- Laboratory sessions for practical experiences for better understanding and application.

The data obtained was verified while conducting the semi-structured interview with the students (former and present) and teachers.

6. How was B.Sc. B.Ed. different from the conventional 3 years of B.Sc. and 1 year of B.Ed.?

As per the responses given by the respondents –

- The conventional B.Sc. Program focuses completely on fundamentals of Science subjects, 1 year of B.Ed. Program only focuses on educational concepts, whereas the 4 year B.Sc. B.Ed. Program focuses on both the discipline as well as the pedagogic aspects in depth.
- In B.Sc. B.Ed. Program, due to the extended duration, students would get ample opportunity to learn and apply their understanding to different contexts which would not only strengthen their understanding of theoretical and pedagogical concepts but, would also develop newer interpretations through critical and analytical thinking.

7. How were the pedagogy and the teaching theories merged together?

While theory inputs are derived from the basic disciplines, it is only through practical and school based experiences that the learner would be able to understand the same in its educational perspective. *Thus, learners would be shown the connection* between content knowledge and pedagogical knowledge in science teaching.

As per the responses given by the respondents, various ways adopted by the teachers to merge pedagogy and teaching theories were as follows:

- Classroom discussions and interaction in which the students understand the basics of science education and pedagogy of school subjects.
- Various practical assignments in which components of Education were merged with Science.
- In simulation phases and practice teaching, students were encouraged to use different methods to implement the lesson plans

8. What were the teaching methods used by the teachers in transaction of the curriculum?

6 teachers out of 10 responded in favor of students centered methods used and 3 out of 10 responded in favor of teacher centered method and remaining 3 teachers responded that both the methods were used as per different topics. However, in support of the mix methods, respondents responded that primarily students-centered and problem solving methods were used.

9. What were the problems faced by the teachers in the transaction of the curriculum?

As per the responses given by the respondents, various difficulties faced by them in the transaction of the curriculum were-

- Entry level knowledge of the students was limited and they would now have to study additional science components which would be an additional load
- The Program was 'credit' heavy in comparison to other undergraduate programs due to the additional subjects being taught and the additional components had to be transacted within the specifications of the same academic calendar
- Students were primarily from the vernacular background and had to master the language of instruction i.e. English.
-

10. What was the unique feature of the curriculum that helped the students to be a better teacher?

As per the responses given by the respondents, the unique features of the curriculum that helped the students to be a better teacher were-

- Amalgamation of teaching theories and science concepts not only ensured better quality teaching skills, but also strengthened the knowledge and understanding that Content and Pedagogy cannot be treated as mutually exclusive
- Incorporation of research developed research acumen to be a better teacher.
- Extensive field based experiences, which included carrying out pedagogic schemes in schools and other Institutions, gave a better understanding of field realities.
- Towards the development of a wholesome personality, adequate space was created for developing other sensibilities than mere discipline based learning in the form of courses like Language, ICT and Library related competence as well as Self development.

11. Was there any up gradation made in the curriculum?

5 out of 10 teachers responded that curriculum was upgraded, while 4 out of 10 teachers responded that it was not upgraded, whereas 1 teacher did not respond to this question. Those in favor of the statement, further mentioned that up gradation was made by redistributing the credit points and the flow of topics in some courses were also changed.

The data was crosschecked in the documents of B.Sc. B.Ed. Program and it was found that only the flow of topics was changed. However, periodic revision is done so that the Program keeps pace with changing trends.

4.2.1.6. Interpretation of Data related to Curriculum and its Transaction

From the data analyzed, following interpretations can be made:

The B.Sc.B.Ed. Program had a unique curriculum, which was a blend of Sciences and Education with more credit points allotted to Science and Mathematics (172) and Education (72). The factors considered in preparing the curriculum were reflected in the curriculum prepared. The students were required to study all four subjects (Biology, Physics, Chemistry and Mathematics) in first four semesters, which is not commonly studied together. Thus, it was ensured that the Program generates Science teachers with a broad based disciplinary knowledge. The innovative methodologies used by the teachers ensured effective transaction of the curriculum.

However, since the entry level knowledge of the students was limited and they would now have to study additional science components, this would be an additional load. The Program was 'credit' heavy in comparison to other undergraduate programs due to the additional subjects being taught and the additional components had to be transacted within the specifications of the same academic calendar which was an arduous task. Students were primarily from the vernacular background and had to master the language of instruction i.e. English - this was a barrier to the smooth and effective transaction of the curriculum. The extensive exposure given to the students ensured that the concepts are learned as well as transacted well.

4.3. Analysis and Interpretation of data obtained from the semi-structured interview

Semi-structured interview was conducted with the teachers and coordinator, students (present and former), and members of Academic Advisory Board in order to know about their perception about B.Sc. B.Ed. Program.

4.3.1. Analysis related to OBJECTIVE 3

The objective was to study the perception of functionary (Coordinator and Academic Advisory Board members), teachers and students (present and former) about B.Sc. B.Ed. Program.

4.3.1.1. Analysis of data obtained from the Semi-Structured Interview conducted with the Teachers of the B.Sc. B.Ed. Program.

1. How do you see this program as a teacher?

The responses give by the teachers were:

- Since this was a four-year integrated teacher education Program, it had an immense capacity to generate 'quality' teachers with expertise in content as well as pedagogy. The extensive duration ensured more enrichment.
- Moreover, Science teachers would become conversant with subject knowledge, pedagogical knowledge and also the knowledge of context in which their learning was to be applied.

Similar responses were given by the Coordinator as well as the Academic Advisory Board members of the Program.

2. How does the program mold the students to become a better teacher?

On being asked about molding the students to become a better teacher, the teachers replied:

- In addition to the rich curricular inputs, the experiences for self-development carried 24 credits in the curriculum. This ensured a holistic personality development i.e. students not only became a teacher with strong content, but also a teacher with exposure to different co-curricular and extra mural activities.
- The data related to the credit allotted to the self-development was verified with the official documents of B.Sc. B.Ed.
- Also they said that in 3 years B.Sc. Program, the students were required to choose a specialization from - Botany, Chemistry, Physics, Mathematics, Statistics, Geology, Geography and Zoology; whereas in B.Sc.B.Ed. Program, the students learned all the subjects – Sciences and Mathematics apart from their specialization subject separately. This gave them a broad based disciplinary knowledge enriching their understanding of both the subjects.
- Initially, students found it difficult to cope up with the curriculum designed, but gradually they came to accept the benefits of the integrated Program.

3. What were the teaching difficulties?

On being asked about the teaching difficulties faced by them, teachers replied that the language was the biggest barrier since the students came from a vernacular background and were not very fluent with the medium of instruction i.e. English, transaction of the curriculum often posed a challenge. In order to address this issue, additional sessions were conducted for the students to improve their communication in English. The students also shared about the language barrier when asked about difficulties they faced.

4. What were the challenges?

On being asked about the challenges that they had to face in dealing with the students, the teachers replied: teaching the compulsory components of Biology and Mathematics was challenging, since those who had opted for biology at Std 12 level faced difficulties in studying mathematics and vice versa.

Also, the Program emphasized the integration of technology as a thinking tool and thus, making the students techno-savvy was also a big challenge for them. Some of the teachers also said that there were many cultural differences which had to be bridged posed a unique challenge for the teachers.

The similar responses were given by the teachers in the open-ended and closed ended questionnaires, when asked about the difficulties faced in transaction of the curriculum.

5. Did you find any learning difficulties in students? If yes, what were those difficulties?

On being asked about the learning difficulties in students, all the teachers responded that there were no learning difficulties in students. All of them were competent enough to learn the concepts.

6. What is the scope of the program?

On being asked about the scope of the Program, the teachers replied:

The requirement of schools was to get competent science teachers who are trained to teach science and mathematics as a combination, which was difficult to find in the traditional 3 year of B.Sc. and 1 year B.Ed. Program.

The B.Sc. B.Ed. Program, by including the subjects as compulsory components in the initial semesters, generates 'science teachers ', who are trained to teach Science and Mathematics exclusively. These unique components enhanced the scope of the Program.

Also they said that, since students are learning several concepts of M.Sc. in the four year Program, they can pursue their higher studies in Science as well as in Education. They are also eligible for appearing for the Central Teacher Eligibility Test (CTET) and other such competitive exams. The similar response was given by the coordinator and the members of Academic Advisory Board.

7. What changes did you see in the students after completion of the Program?

On being asked about the changes that they find in students after completion of the Program, teachers replied:

The students were much more confident now. Initially, they were reserved and hesitant to share their thoughts. But gradually due to the exposure that they received, they became more confident and interactive.

They also said that, the research component in the last semester has helped them to develop the research acumen

The students had the similar view when asked about the changes that they found in their personality after the completion of the Program.

4.3.1.2. Analysis of data obtained from the Semi-Structured Interview conducted with the Coordinator of the B.Sc. B.Ed. Program

1. How do you see this program as a teacher?

The coordinator replied that:

It was an intensive and rigorous four-year integrated teacher education Program aimed at developing both the disciplinary knowledge and pedagogic expertise of the students. She further said that the curriculum of the Program was designed to impart holistic education.

Similar responses were given by the teachers in semi-structured interview, when asked about their views on the Program.

2. How does the program mold the students to become a better teacher?

On being asked about molding the students to become a better teacher, the Coordinator shared the following facts about the Program –

The curriculum envisaged that a variety of learning modes would enrich and enhance learning. Accordingly, every Course of study was visualized and transacted via a variety of modes of learning engagement which were mainly learning centric, supplemented appropriately by teacher designed modes. Students were to be given ample opportunity to learn and apply their understanding to different contexts which would not only strengthen their understanding of theoretical and pedagogical concepts but, would also develop newer interpretations through critical and analytical thinking. Learning engagements would be visualized as being more active/interactive, and would connect concepts across science and education and thus such experiences would not be burdensome but challenging and engaging. On field experiences would be provided and spread across semesters to provide ample opportunity to understand

and practice in the real situations**.** Consequently, issues and challenges would surface and solutions to these would have to be designed through research which would be an integral component of the program. Similar responses were given by the teachers in semi-structured interview when this question was asked to them.

3. What challenges did you face in the functioning of the Program?

On being asked about the challenges faced in functioning of the Program, the Coordinator replied that major challenges faced were-

First, since this was a unique Program, getting teachers with dual degrees was challenging.

Second, the Program was a unique one as also a deviation from the traditional Programs and the challenge lay in getting acceptance for the same.

Third, the Program was both rigorous and intensive and the challenge was to implement the curriculum within the framework of the academic calendar including the additional components.

Similar responses were given by the teachers of the Program, in the open-ended and closed ended questionnaire of Curriculum and its transaction.

4. What is the scope of the program?

When asked about the scope of the Program, the Coordinator replied that the scope is clear with the outcomes of this Program. The students who had undergone the 4 year Program, had benefited immensely and today almost all of them were very well placed - many of them had cleared their TET exams while many of them were pursuing their post graduate studies in reputed Universities; the others were employed in Govt schools across Gujarat.

Similar responses were given by the teachers in the semi-structured interview.

4.3.1.3. Interpretation of data obtained from the Semi-structured interview conducted with the teachers and the coordinator of the Program

Following interpretations can be made from the data analyzed:

Longer duration of the Program ensured greater time allocation to various aspects like practice teaching, simulation and various visits. Hence it ensured more active engagement with the content as well as its transaction

It can be interpreted that learning the concept and its implementation in school helped them not only to grasp the pedagogical concept, but also helped them to learn the innovative teaching strategies, which helped them to become better teachers. Designing learning experiences to help students overcome their language barrier was challenging for the teachers.

It can be interpreted that the reason behind the enhanced confidence level of the students after the completion of the Program was the exposure given to them in terms of various rigorous fieldwork and visits. Content mastery helped the students to crack competitive exams like CTET.

4.3.1.4. Analysis of data obtained from the Semi-Structured Interview conducted with the Members of Academic Advisory Board of the Program

What are the innovative aspects of the program?

On being asked about the innovativeness of the Program the academic advisory members replied that, the concept of integration itself is innovative. The integration is not only among the Sciences but also among Science and Education. Thus, the essence of the Program lies in its integration.

Further they said that the innovativeness lies in its holistic approach of transacting science subjects like physics, chemistry, biology etc, and the educational subjects. Interdisciplinary topics and field work were the innovative aspects of the Program.

1. What challenges do such programs face?

When asked about the challenges faced by such Programs, the members responded that, the challenge lies in convincing about the integrated teacher education Program to the education community as a whole. Convincing the government authorities, college authorities, and faculties is a challenging task.

2. What is the scope of the program?

According to the academic advisory board members, the scope of the Program lies in its utility and in its uniqueness. They further added that the Program is amalgamation of both science and education, so it opens corridor for students to pursue career in education as well as in sciences. Moreover, they can clear many competitive examinations.

4.3.1.5. Interpretation of data related to Semi-Structured Interview conducted with the Members of Academic Advisory Board of the Program

From the data analyzed, it can be understood that the members of Academic Advisory Board see the Program holistically and not in fragmented way, because the innovative aspect of the Program is the integration of sciences and education. Moreover, the scope is the product of the processes in which this integrated approach is transacted in the classroom.

4.3.1.6. Analysis of data obtained from the Semi-Structured Interview conducted with the Students of the B.Sc. B.Ed. Program

1. What was the reason for joining the program?

On being asked about the reason behind joining B.Sc. B.Ed. Program, students gave following reasons:

Table: 5 Responses of students regarding the reasons for joining the program

Sr. No.	Reasons	%
1.	Parent's expectations to become a teacher	10
2.	Availability of Government Scholarship	50
3.	No English Medium Science College in villages	35
4.	Convenient profession for women	5

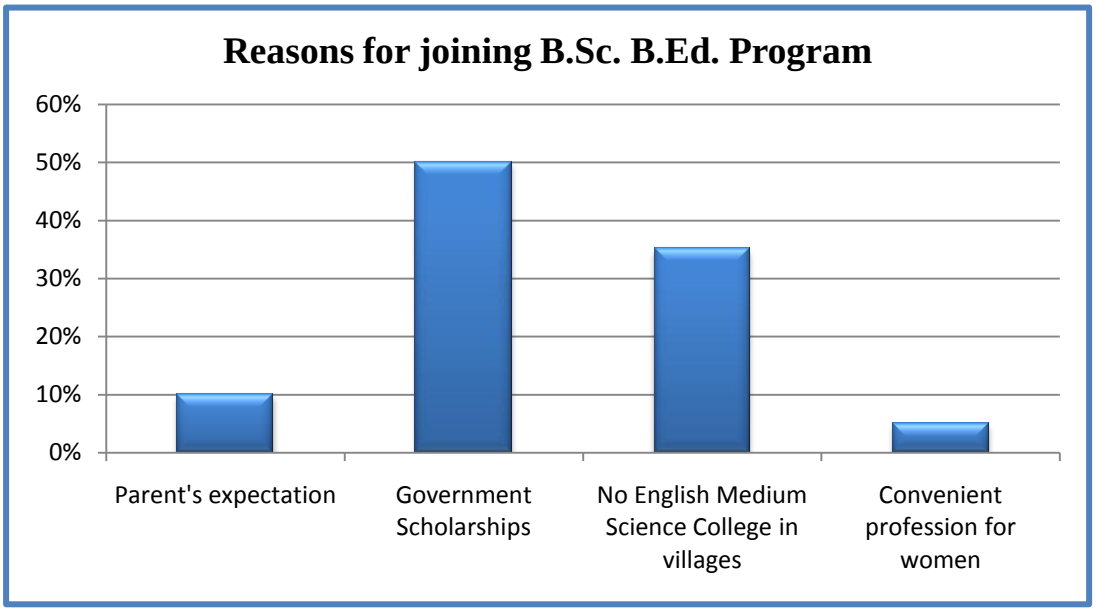


Figure 3: Reasons for joining B.Sc. B.Ed. program

As indicated by the data represented in the previous page, 50% of the total students joined the program as they were getting Government Scholarships. 35% of them joined because there were no English medium B.Sc. colleges in their village. 10% of them joined as their parents expected to do B.Ed. after graduation in science, and only 5% of them joined considering teaching as a convenient profession for women.
However, the interest towards the teaching profession was not the reason given by any student for joining the program.

2. Did the program help you in making your content strong? How?

On being asked whether the Program helped them to make their content strong, all the students had a same view. According to them, their content was strengthened to great extent, due to following reasons:-

Table 6: Responses of students regarding the sources that helped them to make their content strong

Sr. No.	Reasons	%
1.	Learning the concept and its implementation in school	10
2.	Facilities and Books provided	50
3.	Combination of Mathematics and Biology	35

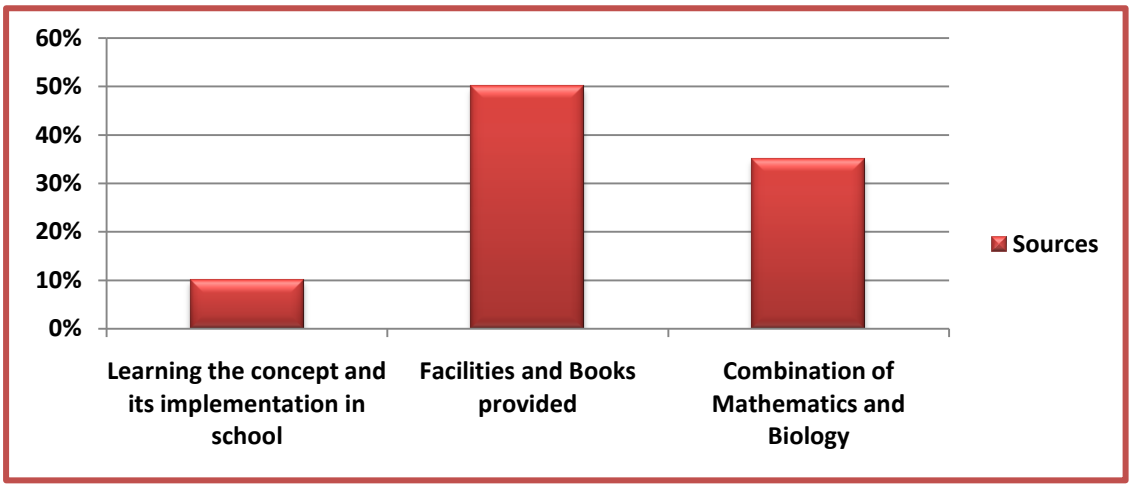


Figure 4: Sources that helped the students to make their content strong

As indicated by the data represented in the previous page, According to 50% of the total students facilities provided and the books were enough for them to make their content stronger.

According to 35% of the total students, the unique combination of Mathematics and Biology helped them to make their content stronger in both the pedagogical subjects.

According to 10% of the total students, learning the concept and teaching the same takes place simultaneously, naturally the content becomes strong.

3. What difficulties did you face at the initial stage of the program?

On being asked about the difficulties faced by students at the initial stage, 90% of them said that language was the biggest barrier. Except one student, all of them did their schooling from Guajarati medium. They were unable to speak and understand English.

10% of them found difficulty in adjusting to the urban climate was difficult as they had come from rural areas.

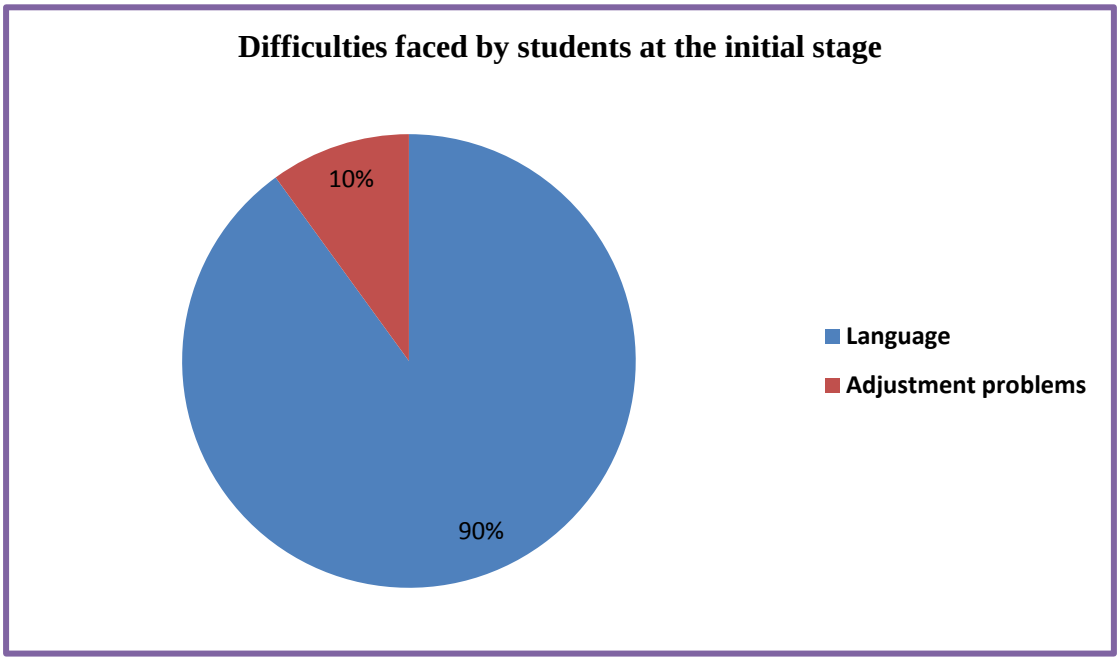


Figure 5: Difficulties faced by students at the initial stage of the program

From the above diagram it can be understood that the major difficulty faced by students was of related to language. Adjusting different culture was yet another difficulty faced by students.

4. How did the program help you to become a better teacher and most importantly a better person?

On being asked about, how the program helped them to become a better teacher and a person, following responses were given:

Table 7: Responses of students regarding how the program helped them to become a better teacher and a better person

Sr. No	As a Teacher	(%)	As a Person	(%)
1.	Learned new Methodologies	50	Open-minded	15
2.	Can explain any concept of Science and Mathematics with ease	25	Confident	25
3.	Can engross learners with teaching learning process	25	Sensitized towards the educational needs of the students with poor socio-economic background	60

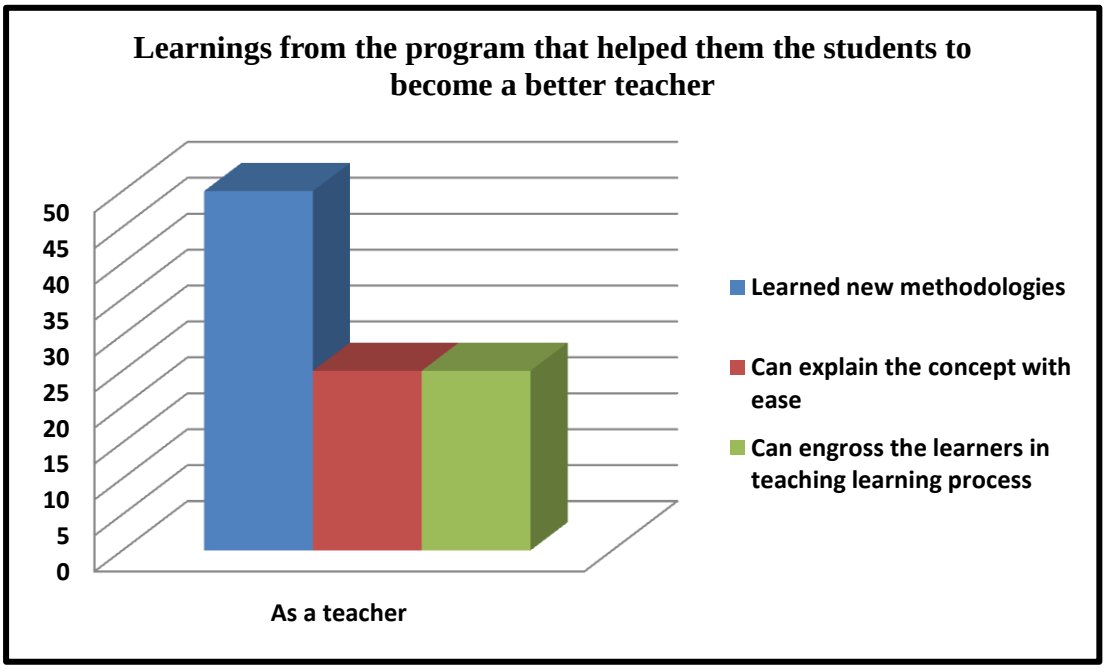


Figure 6: Learning of the students from the program that helped them to become a better teacher

As indicated by the data represented, 50% of the total students learned new methodologies, while 25% of the students can explain any concept of Science and Mathematics with ease, and the same percentage of the students can engross the learners in the teaching learning process due to the different teaching strategies learned in the program. All these factors contributed to help them become a better teacher.

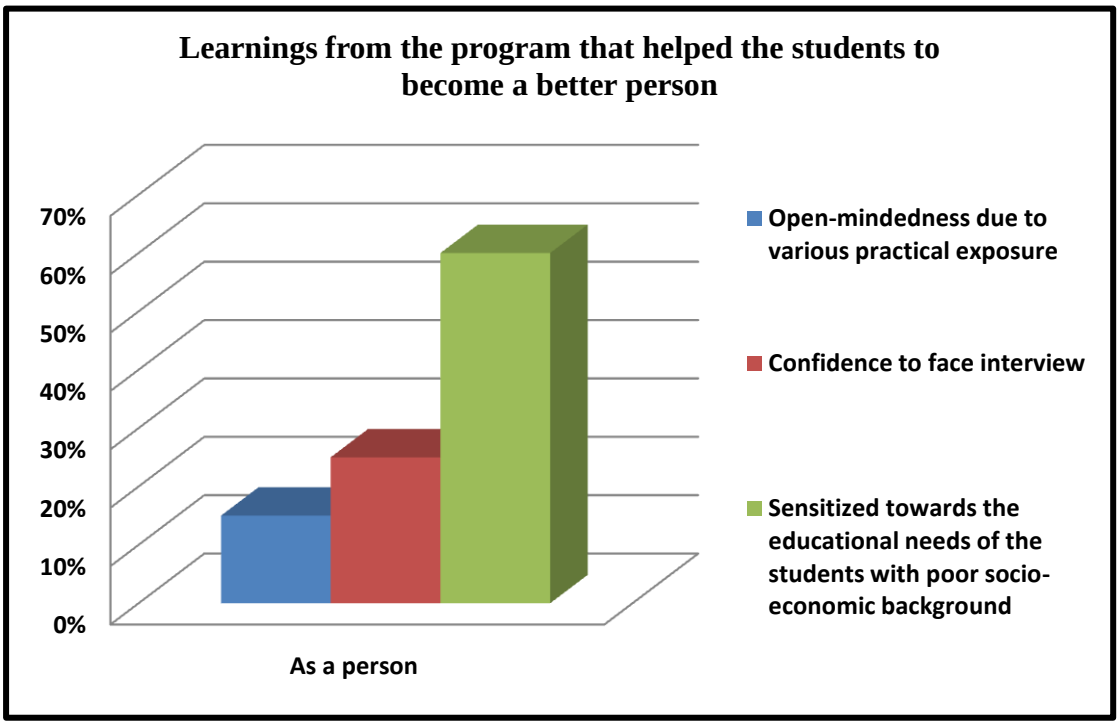


Figure 7: Learning of the students from the program that helped them to become a better person

5. What innovative things have you learned in B.Sc. B.Ed., which you learned nowhere in your life?

On being asked about the innovative things learned in this Program, all of them said that extra-murals which include calligraphy, art-craft, theatre, etc were the best component of the Program. And also said that, it was something that they learned nowhere in their life.

6. In which area did you find improvements in yourself?

On the basis of the responses given by the students, following data can be extracted:

Table 8: Responses given by students regarding their area of improvements

Sr. No.	Area of Improvements	%
1.	Can Communicate in English	30
2.	Have Content Mastery	40
3.	Can interact with proper eye contact	20
4.	No Stage fear	10

The graphical representation of the tabulated data is shown in the next page.

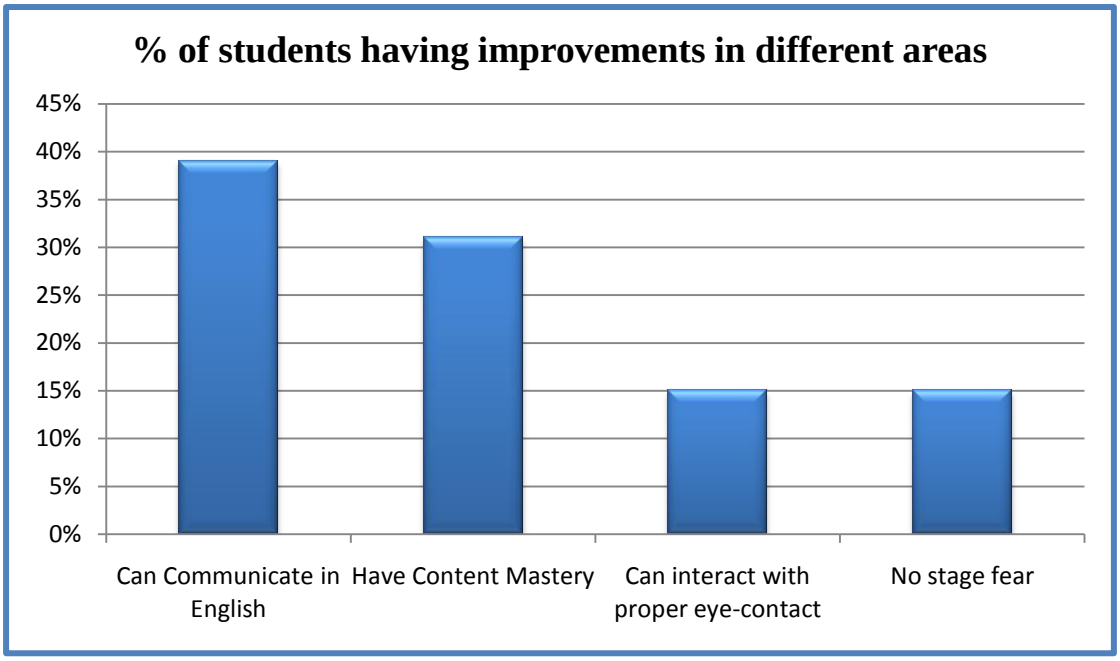


Figure 8: Area of improvements in students

As indicated by the above representations, 30% of the students said that they were able to communicate in English; 40% said that they can proudly hold the honor of having content mastery. 20% of them said that they can interact with proper eye-contact, which was not possible in initial stage. 10% of them said that learned how to conduct assemblies effectively, and make it interesting. Their stage fear has completely vanished because of classrooms assemblies that they used to arrange.

7. Please give your valuable suggestions for the betterment of program if any.

On being asked if they would like to give their suggestions for the betterment of the Program, most of them said that the Program is best suited for all those who want to

be in teaching field and as such it does not require any changes as it is designed considering all the needs of those willing to enter in this field. However, some of them said that if assignments were less then they can focus more on enhancing their skills, which was contradicted by few saying that assignments are source of enhancing the skills.

8. Did the Program help you to be financially independent?

On being asked about whether the Program helped them to become financially independent, 90% of them replied positively. They said that they can work as a teacher in Guajarati medium schools but not in English medium because those schools require teachers who have done their schooling from English medium.

10% of them said that when the campus placements were conducted they did not sit in it voluntarily as they themselves were not willing to teach in English medium schools but instead clear the TAT exam and get placed in Guajarati medium government schools. The reason given for it was to impart quality education to the students who are deprived of it.

9. Please give your valuable suggestions for the improvement needed (if any) for the Program.

On being asked if they would like to give their suggestions for the betterment of the Program, all the students had a same perception. According to them, the B.Sc. B.Ed. Program gave them enough exposure which was not given in any other college. They said that, 'In rest of the college only lecture method is followed. But in B.Sc. B.Ed. Program we are catered to variety of methodologies and numerous visits. Students are their prime focus and students are given opportunity.' Hence, according to them the suggestions were not really required as the curriculum was designed and implemented looking into consideration the needs of the learners.

The data regarding variety of methodologies used was verified with the open-ended and closed ended questionnaire used to study curriculum and its transaction.

4.3.1.7. Interpretation related to Semi-structured Interview conducted with the Students of B.Sc. B.Ed. Program

From the data analyzed, perceptions of the students about B.Sc. B.Ed. Program can be interpreted as follows:

Although most of the students joined the Program due to several reasons (not because of their interest towards teaching), they developed interest in the subjects. Initially, they had difficulty in communicating which gradually vanished with the support of teachers and the books and other facilities.

The reason for their confidence was their content mastery achieved due to constant learning of the concept, and its transaction in schools. Moreover, they were now more sensitized towards the schools with poor quality of teachers, because they themselves had undergone the same treatment. Therefore, many of the students preferred to work in the schools of their native place, since they wanted to utilize their skills for the students of the schools in their village.

It can be interpreted that the B.Sc. B.Ed. Program had not only generated 'quality science teachers' to teach mathematics and science as a combination, but also generated teachers with sensitivity, who can give back what they have received from the society.

Pictures of the Infrastructure

Old Building

New building

Laboratories - Physics

Laboratories – Biology

Laboratories – IT

Pictures of Teaching and Learning

Pictures of Sports Facilities

Pictures of Self Development

CHAPTER 5: SUMMARY

5.0. Introduction

The chapter mentions the overall summary of the present study. It incorporates brief idea about different aspects of the study. The major findings of the study along with discussions related to the theme of the study and recommendations for future researchers related to similar fields of study are enlisted in this chapter. It is coupled with the investigator's own derivation and reflections upon the same.

5.1. Background of the Study

A strong education system is the cornerstone of any country's growth and prosperity. Teachers are the important builders of this strong educational system, because teaching is a profession that teaches all of the other professions. The future of coming generations is molded by teachers. Hence in order to generate teachers with great vision, teacher education plays a significant role.

Availability of qualified, trained and highly motivated teachers is an important factor in ensuring meaningful access to education. It is argued that high proficiency in the teaching subject, good linguistic ability, efficiency in communication skills and love for children are some of the desirable qualities of a good teacher (Arora, 2002:93).

Thus, Teacher qualification and training coupled with a high morale and positive perception of the academic ability of the learners constitute a powerful set of factors determining the learning levels of the children.

In order to provide teachers with the above mentioned traits, teacher education programs create a foundation for teachers. The National Council for Teacher Education has defined teacher education as, 'A program of education, research and training of persons to teach from pre-primary to higher education level.'

Teacher education is based on the theory that, 'teachers are made, not born.' in contrary to the assumption, 'Teachers are born, not made.' Since teaching is considered an art and a science, the teacher has to acquire not only knowledge, but also skills that are called – 'tricks of the trade.'

Thus, Teacher education as a whole needs urgent and comprehensive reform. There is a need to bring greater convergence between professional preparation and continuing professional development of teachers at all stages of schooling in terms of level,

duration and structure. Considering the complexity and significance of teaching as a professional practice, it is imperative that the entire enterprise of teacher education should be raised to a university level and that the duration and rigor of programs should be appropriately enhanced.

5.2. Higher Education System of India

India has travelled a long way in education, from the "Guru -Shishya" practice of learning under the shade of a tree in medieval times, to becoming the second largest in the field of higher education world over after United States. With 700 universities and more than 35,000 affiliated colleges enrolling more than 20 million students, Indian higher education is a large and complex system.

5.2.1. Evolution of Higher Education System in India

What is higher education? To put it simply, it is a stage of learning that occurs after secondary education at the Universities, Colleges and Institutes of Technology. The aim of higher education is to prepare a person to play his part well, as an enlightened member of society.

Higher education in India is evident right from our ancient time. India had variety of ancient higher learning institutes, but some of our prime higher learning institutes were: Puspagiri, present day Orissa which was established in 3rd century A.D.; Nalanda was established in 5 A.D. in Bihar; Takshashila's existence dates back to 5^{th} or 6^{th} century B.C.

All these ancient Institutions were far more advanced in terms of different field of studies and subjects offered, as compared to today's institutes of higher education. The students were not restricted merely to one field of study. They were made to study subjects like fine arts, medicine, mathematics, astronomy, politics and the art of warfare, i.e. the combination of all the subjects.

In Pre-Independent and Post-Independent period, higher education system evolved significantly. The Compulsory Education Acts passed during the period 1921-1937 gave a great impetus to better quality of higher education.

During post-independent period, the exercise of higher education transformation started with the constitution of the University Education Commission (1948) with Dr. S. Radhakrishnan as its chairman. The Commission was appointed to report on Indian University Education and suggest improvements. In order to have a global view of

education, another Commission under the name of Education Commission was set up in 1964 under Dr. D. S. Kothari as chairman called the Kothari Commission. One of the aims of Kothari Commission was strengthening of the Centers of Advance Study and setting up of a small number of major universities which would aim at achieving high standards in education. (Altbach, Philip G., 2005)

On the basis of the viewpoints available from various social organizations and committees, expert bodies like that of University Grant Commission (UGC), National Council of Educational Research and Training (NCERT), National Institute of Educational Planning and Administration (NUEPA) and numerous regional and state level bodies were formed

Today's higher education system has restricted the student's caliber in customary three year degree programs with little or no scope of skill development, as it restricts the student's caliber to simply study one field of study that they have chosen for specialization. However, with the inception of concepts like Interdisciplinary, Trans-disciplinary approaches as well as the integrated courses in Higher Education System of India, we are on the threshold of a massive transformation in the scenario of Higher Education.

The Indian education system is demonstrating a gradual adaptation of the 10+2+4/5 concept viz. 10+2 years of schooling, and 4 years of dual degree program, which is termed as 'Integrated Education programs.' The Teacher Education program, which used to be one year, is also undergoing a change with the introduction of Integrated Programs like – B.A. B.Ed. and B.Sc. B.Ed.

5.2.2. Evolution of Teacher Education System of India

The origin of teacher education can be prominently traced back to early 19th century. State initiatives for teacher training were ensured in 1815 which is one of the earliest recorded views in support of the training need of schools teachers. In 1947, at the eve of independence, there were 650 training schools with enrolment of 38,770 students. The number of secondary training colleges all over the country was only 42 with an enrollment of 3100 teacher trainees. In the field of teacher education, many new trends and innovations have emerged in our country and abroad.

After independence, Government of India took the task of reconstruction of Indian education on priority basis. Likewise many Committees and Commissions were set up

by the Government of India for strengthening the system of teacher education in India.

There are mainly three types of teacher training institutions for imparting training to teachers of elementary, secondary and tertiary levels of education respectively. In pursuance of the proposals of the National Policy on Education (NPE) 1986, the Government of India has established 48 Academic Staff Colleges (ASCs), which impart in-service training to teachers in Higher Education. (Rao, D. Pulla., 2009).

As per the statistical report of MHRD (Statistics of School Education, 2010-11), India has 2100462 and 1887343 teachers in primary and upper primary schools respectively, out of which 90% of the teachers from each categories are trained.

This show that still there is a significantly large percentage of untrained teachers working in the schools at all India level. Thus, there is a dearth both in terms of numbers and the quality and conscious efforts would have to be made to generate better quality of teachers.

5.3. Inception of Integrated Teacher Education Program

5.3.1. Meaning of Integrated Course

'Integration' as the word suggests means the action or process of integrating i.e. the action of combining things to form a whole. (Pocket Oxford English Dictionary, 10th edition, p. 474). Therefore, we may develop the meaning of integrated course as, 'a course that covers several subjects or integrates several subjects, emphasizing the interlinkages between them.'

An integrated study program comprises of a curriculum that is jointly designed by two or more disciplines and is regulated by a specific set of guidelines. Students who choose the program undertake defined periods of study in each institution or discipline in terms of duration and content. At the end of the courses and after relevant examinations, students are awarded a single qualification jointly signed by the academic authorities of both institutions and/or disciplines.

5.3.2. History of Integrated Program in Teacher Education

5.3.2.1. The period of 1960's in education

The period of 1960 was an innovative period in education. In 1961, Ministry of Education established NCERT with an aim to devise improved techniques of training and building competent professional leadership. As a result, a new thinking developed

in the field of teacher education which was to make B.Ed. course an integral part of graduate degree program. Instead of B.A., B.Sc., B.Com, degrees taken separately, four year degree course would provide the student degrees of B.A. B.Ed., B.Sc. B.Ed., and B.Com. B.Ed., depending upon subject matter of the specialization. This degree was to be taken in four years after 12 years of higher education i.e. 10+2+4.

NCERT then established the Regional Colleges of Education at Ajmer, Bhubaneshwar, Mysore in 1963-64 and at Bhopal in 1964-65, in which concurrent and integrated programs were introduced with the intention to prepare the teachers fully in terms of content of the subject matter and the teaching methodologies. This experimentation was aimed at producing a better and more effective model of teacher education than the prevailing one year pedagogical training after graduation in a degree college. Similar experiments were also made in Kurukshetra University and Sardar Patel University in Vidyanagar. But before the experiment could take its root, the review Committees like Nag Chowdhury Committee, Kapoor Committee (1974), Mathur Committee (1978) etc., which were set up in regular interval recommended certain suggestions against the four year integrated course, as a result this course in Regional Colleges of Education were discontinued. But after few years, the four year integrated courses in the Regional Colleges of Education were restarted and continuing till today. (Dibakar, S., 1992)

5.3.2.2. Kurukshetra Experiment

Adoption of the four years integrated teacher education program on the lines of teachers' college of U.S.A. in which academic and professional courses were taught simultaneously started in July, 1960 in the College of Education at Kurukshetra. This was on the forceful suggestion of Late Dr. A.C. Joshi, the then Vice-Chancellor of Punjab and Kurukshetra Universities who, having been impressed by the program of teacher education in the U.S.A. convinced the then Punjab Government which later studieD the detailed program and approved it for implementation. Thus, the College of Education came into existence.

The courses of the scheme were so decided as to prepare teachers of subject matter specialities with thorough background in their subject areas in high schools. The pre-service teachers were to read an advance course in subject matter specialisation along with minor courses in other subjects. They were awarded the degree of B.Sc. (Education), B.A. (Education) depending on the subject areas.

The courses were revised in 1966 and brought at par with B.Sc./B.A. courses of the University in order to facilitate these graduates to take admission into post graduate classes. Over and above the courses for B.A. / B.Sc. they were having additional professional courses equal to the B.Ed. course. The degree was revised to be B.A. B.Ed., B.Sc. B.Ed., instead of B.A. (Education) / B.Sc. (Education). (Dibakar, S., 1992)

5.3.3. Need for Integrated Courses in Teacher Education

The Indian Education Commission (1964-66) observed that of all the different factors which influence the quality of education and its contribution to the national development, the quality, competence and character of teachers are undoubtedly the most significant. An excellent education system does not happen by chance, but by knowledgeable, reflective, and socially just educators teaching a meaningful and relevant curriculum.

The EFA goals (Education for All) and MDG 2 goals (Millennium Development Goals-2) cannot be realized unless needs of all learners are met and this is highly dependent on teaching quality. Teaching and teacher quality have innumerable definitions and are sometimes linked together and sometimes treated as separate issues.

After the education system in India has got revolutionized; many things have got altered and introduction of integrated courses is one of them. One of the reasons why we need Integrated Teacher training programs - as per one of the articles in the newspaper called, 'The Hindu', dated 27th February'2012, experts from the Regional Institute of Education (RIE) and the National Council for Educational Research and Training (NCERT) have stressed the need for introducing a four-year integrated B.Ed. course to improve the quality of training for teachers.

Moreover, in conventional one -Year B.Ed. programs, students have to rush to learn the methodologies in the span of nine to ten months which is not adequate. Therefore, one of the major recommendations was the emphasis on introducing an integrated four-year B.Ed. program to help students imbibe teaching methodologies over a period of time while completing their graduation in their subject of interest.

Such programs would allow extensive disciplinary and pedagogical knowledge over the extended period of four years. However, experts say that not many private

institutions are prepared to offer such courses, but there is a general perception that the universities can definitely take an initiative in introducing it.

There is a clear need of an integrated approach in Teacher Education as the teaching methodologies cannot be learned in a short period of time and a conventional one year B.Ed. program cannot assure a good quality of teachers.

In four-year integrated teacher education programs, the content of the subject matter as well as the teaching methodologies go hand in hand, resulting into better quality of teachers.

5.3.4. Policy's and Commission's Recommendations

The roles and responsibilities of the teachers have been redefined and hence the onus of being a teacher needs to be enlightened right from the pre-service phase of the teacher. This is not possible through one year teacher education program. It needs extended teacher training education program

It is very well reflected in The Chattopadhyaya Committee Report of the National Commission on Teachers (1983-85) which envisioned the New Teacher as one who communicates to pupils "…the importance of and the feeling for national integrity and unity; the need for a scientific attitude; a commitment to excellence in standards of work and action and a concern for society." The Commission observed that "…what happens in the majority of our Teaching Colleges and Training Institutes is woefully inadequate…" "If teacher education is to be made relevant to the roles and responsibilities of the New Teacher, the minimum length of training for a Secondary teacher should be five years following the completion of Class XII." Reiterating the need "…the Commission recommends that "…to begin with, we may have an integrated four year program which should be developed carefully…it may also be possible for some of the existing colleges of Science and Arts to introduce an Education Department along with their other programs allowing for a section of their students to opt for teacher education." The Chattopadhyaya Commission recommends a four-year integrated course for the secondary as well as the elementary teacher.

Restructuring and reorganization of the Centrally Sponsored Scheme on Teacher Education- Guidelines for Implementation, (2012), emphasized the need for teacher education to be "…brought into the mainstream of the academic life of the Universities on the one hand and of school life and educational developments on the other" (Kothari Commission, 1964-66). It is indeed a matter of concern that teacher

education institutes continue to exist as insular organizations even within the University system where many are located. Recognising 'quality' as the essence of a program of teacher education, the Commission recommended the introduction of "integrated courses of general and professional education in Universities…with greater scope for self-study and discussion…and…a comprehensive program of internship."

The policy emphasizes the sad present state of Teacher Education in the country and makes recommendations for its enrichment, via the introduction of Integrated Programs.

5.3.5. Reflections on four-year Integrated Teacher Training Program as per NCFTE 2009

Isolation of education as a discipline from the system of higher education is identified as one main cause for the continued low status of educational studies. Several suggestions have been made to deal with this issue. One proposal is to diversify specializations into areas of curriculum and pedagogic studies in mathematics, languages, social sciences and sciences and encourage students to pursue post-graduate studies in a chosen discipline along with the option of specializing in a select curriculum and pedagogic study course. It is also suggested that undergraduate students be provided with a variety of routes to pursue studies in education like four-year integrated courses in elementary and secondary education, electives in educational studies in undergraduate programs of general education, followed by a range of post-graduate studies in education, social sciences, sciences, humanities, mathematics, language studies and the liberal arts. Such diverse routes are likely to tap talented and motivated young people to enter into education and pursue options such as teacher education, research, curriculum, pedagogy. (NCFTE, (2009), pt. 5.7)

Upgrading teacher education calls for participatory curriculum planning involving all stakeholders, modular organization of curriculum in terms of critically engaging with theory and bringing practice within its perspective and a professional approach to teacher education processes. For accomplishing all this, there is a need for a longer duration program, either a four-year integrated model at the Bachelor's degree level or a two-year second Bachelor's degree model. A transition to the new models will need to be done within a definite time frame – say, five years, keeping in mind the

time required for preparation of teacher educators as well. (NCFTE, 2009, pt. 1.5, p. 8)

Features recommended for such integrated program was visualized as follows:

- Foundations of Education located in the sociological, historical, economic, ecological, philosophical, cultural and political context and thought in education.
- Core courses to engage with subject-content with the aim to revisit and reconstruct concepts and perspectives.
- Engagement with theory of pedagogy and hands-on experience in understanding the learner, his/her context and processing of thinking and learning as a base to evolve relevant and appropriate pedagogic strategies.
- Pedagogic courses designed in the frame of broad disciplinary areas such as, Sciences, Social Sciences, Languages and Mathematics rather than individual school subjects.
- Theory courses designed to enable inter-disciplinary engagement as well as to engage with theory in the light of personal experiences and social realities.
- Theory courses to include in-built field-based units of study to enable porous boundaries between theory and practice.
- Rigorous study of a chosen liberal course out of a pool of courses in languages, mathematics, sciences and social sciences.
- Opportunities for developing the self through drama, craft, music, self-development workshops along with a critical engagement with theoretical constructs of identity development and the individual-social interface.
- Extensive and intensive practicum courses to equip teachers with a grip over existing systemic issues in education, a developing capacity to rise to the un-certainties of a learning environment and changing learner needs and a capacity to feel empowered to make a difference.
- Practicum courses to develop other professional capacities and sensibilities: the ability to understand learners in context, evolve developmentally and contextually relevant pedagogies, re-arrange subject-matter to communicate effectively with learners, design and choose appropriate learning experiences activities, learn to observe and document, analyze, synthesize, interpret and reflect.

- Sustained engagement with schools to appreciate the given constraints of a system and to learn to strategize to think out of the box. Understand and learn to negotiate formal learning spaces as sites of struggle, contestation and social transformation.

5.3.6. Recent issues and developments in Integrated Teacher Education Programs

In response to the various ongoing debates and concerns raised regarding Integrated courses, the UGC mandated, "The academic philosophy/rationale behind offering integrated programs should not be for economizing on course requirements or award of double degrees in a fast track. On the contrary, an integrated approach should involve a vertical or interdisciplinary discourse." which means that the integrated courses should not be seen as the short way to get degrees or the most economical way of getting degrees, but it should be seen from the interdisciplinary point of view. Therefore, an integrated or dual degree program will be allowed only if there is no compromise on any of the course requirements, including duration, number of papers and intensity of courses, teaching or learning hours and credits.

Another innovation in the same line has been made by NCTE. According to latest news published by newspaper, NCTE is now going to launch four new Teacher training programs all over India. Intermediate pass candidates who are interested to be a part of teaching field can join B.Ed. Integrated courses called the Bachelor of Secondary Education. NCTE is also going to launch two Diploma Training Programs. The main motto behind taking such initiatives is to improve the quality of education. The Government wants to prepare specialized teacher for special curricula and syllabi. It's expected that first of all this course will be launched in central Universities. Syllabus and Program pattern will be same all over India and admission will also be taken via National Level entrance examination. If everything will be in its place, then it is expected that these Teacher training program will be launched from 2015. NCTE is dedicated to improving the quality of teacher Education. If candidates are interested in 4 year integrated B.Ed. programs then, they can easily take admission after 12th.

The candidates who have qualified Integrated B.Ed. will be eligible for class 8th level teaching whereas, candidates who have qualified 2 year diploma in elementary education will be eligible for primary level teaching for class 1 to class 5. Universities

and States can also conduct their own entrance exams for admission to these programs.

5.4. Higher Education scenario of Gujarat

Gujarat has 13 state universities and four agricultural universities. The premier management institute Indian Institute of Management in Ahmedabad ranks the best in India and among the best management Universities in the world. The top-notch institutes for Engineering and Research include IIT Gandhinagar, Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT) also in Gandhinagar, Sardar Vallabhbhai National Institute of Technology (SVNIT) in Surat, Pandit Deendayal Petroleum University (PDPU) in Gandhinagar and Nirma University in Ahmedabad. Mudra Institute of Communications Ahmedabad(MICA) is one of the most famous institutes for mass communication and is well-renowned across India.

In addition, Institute of Rural Management Anand (IRMA) is one of the leading sectoral institutions in rural management. IRMA is a unique institution in the sense that it provides professional education to train managers for rural management. It is the only one of its kind in all Asia.

The National Institute of Design (NID) in Ahmedabad and Gandhinagar is internationally acclaimed as one of the foremost multi-disciplinary institutions in the field of design education and research. Centre for Environmental Planning & Technology University, popularly known as (CEPT) is one of the best planning and architectural school not in India, but across the world; providing various technical and professional courses.

Lalbhai Dalpatbhai College of Engineering (LDCE) is also one of the top engineering college of the state.

5.4.1. About Vadodara

Vadodara is also known as ‘Sanskari Nagari’, which means a ‘cultured city’ due to rich deep rooted cultural traditions. Vadodara has a vibrant history related to Art and Architecture. Since the era of Royal Gaekwad family, it has been a hub of Arts and Literature. Hence, it has been bestowed the title of "Kala Nagari". Vadodara is synonymous with education. The patronage of education started with Maharaja Sayajirao and the city has built further on the academic infrastructure established by

5.4.2. Higher Education in Vadodara

The Maharaja Sayajirao University of Baroda, Vadodara, is a premier university of Gujarat. It is one of the oldest universities of Gujarat and provides education in Faculty of Fine Arts, Engineering, Arts, Journalism, Education, Law, Social Work, Medicine, Science and Performing Arts. Originally known as the Baroda College of Science (established 1881), it became a university in 1949 after the independence of the country and later renamed after its benefactor Maharaja Sayajirao Gaekwad III, the former ruler of Baroda State.

The Government of Baroda and its people had for a long time desired to have a separate University of their own. The affiliation of all the institutions of higher education to a University situated far away was not conductive to the development of new courses of instruction suited to the needs of the region. It acted, on the contrary, as an obstacle. The main object of establishing the Maharaja SayajiraoUniverity of Baroda was, therefore,to provide a distinct type of University-a teaching and residential University which should have complete freedom in all academic matters and would be free to institute new branches of studies suited to the needs and aspirations of the region in particular and of the country in general.

The education department was not introduced at that time. It was in 1935, that the Education department came into existence. Moreover, the idea of 4 year integrated program was not reflected in The Baroda University Commission of 1927.

In 1933, Educational Commissioner with the government of India made a survey of Education in the state of vadodara in 1933, wherein he found the paucity of trained teachers in secondary school of the state. He reported the problem in his report and recommended to start Secondary teacher training college. The proposal was accepted by Gaekwad and Secondary Teachers Training College was established in Vadodara in 1935. . It was affiliated to the University of Bombay in the year 1938.This institution became the Faculty of Education & Psychology in the year 1949 as the constituent of the Maharaja Sayajirao University of Baroda with two departments - Education and Psychology.

The department then started with the one year teacher training programs (B.Ed. and M.Ed.).

However, the concept of integrated teacher training program was yet to be introduced at that time. The four-year Integrated Teacher Education Program was the concept introduced for the first time in Vadodara by Navrachana University in 2010.

5.4.3. The Case

The study is a case study of an Integrated Teacher Education Program in an urban, private university situated in Vadodara, Gujarat with a student population made up of both local and residential students who primarily come from the local region and surrounding areas. The student body consists of graduate, undergraduate and doctoral students, faculty and staff. Most students come from the middle class when characterized socio-economically with a fair number of students also characterized as first generation students. The university has a particular focus on the pure sciences, the sciences, and engineering.

The changing realities of the Indian society as well as the school system necessitated changes in transaction and assessment mechanisms in order to be responsive to these changes. In keeping with the above, main thrusts in the program are gicen to - Integrating Science with Education (Pedagogical content knowledge)

- Providing a Variety of modes of learning engagement; Emphasis on field based experiences
- Continuous and Comprehensive Evaluation
- Research Component at the undergraduate level
- Self Development Courses (Extra – Mural Activities, Language Proficiency, ICT, etc.)

The curriculum of B.Sc. B.Ed. program is designed to integrate content with pedagogy meaningfully, in order to prepare future science teachers with a science background together with specific training in science teaching related skills to engage their students in future in meaningful science learning.

5.5. Review of Related Literature

After reviewing various studies revolving around the present Study, the investigator presented some studies after classifying them under 4 broad categories. The implications of those studies for the present Study is presented below.

- Case Studies of Institutions/School
- Attitudes of Teachers towards Teaching Profession
- Professional Development of Teachers
- Effectiveness of Teacher Education/ Teacher Training Programs

5.5.1. CASE STUDIES OF INSTITUTIONS/SCHOOLS

The studies discussed specifically about an individual institute/school which is unique in its own way. Various aspects studied are evolution and development of an institute, its working [Iyer. S., (2010)], also curriculum and curriculum transaction, administrative aspects and infrastructural facilities [Srivastava S and Manvadriya S, (2008)]. The present study also incorporates various aspects like evolution, curriculum and its transaction, administrative aspects, infrastructural facilities, etc., of B.Sc. B.Ed. program of Navrachana University, Vadodara, Gujarat, India. The researcher has taken Case-study as a method of study and hence, the above mentioned researches are helpful in deriving some ideas as to how a case can be presented.

5.5.2. ATTITUDES OF TEACHERS TOWARDS TEACHING PROFESSION

The studies discussed various factors which influence an individual to select teaching as a profession and also their attitudes towards it. The researcher has studied these researches and mentioned it, because the findings of the study outline a dire need for attitudinal shift towards teaching as a profession. As per one of the findings, the girls are influenced by their teaching spouse to join the teaching profession, and not their interest towards teaching. [Aggarwal, Y.P., (1980)] Also, it was found that the teachers do not have a teaching attitude since they join this profession out of no option [Bhandarkar, B.G., (1980)].Hence, from the findings of the above mentioned studies, it can be seen that the individuals lack preparedness to enter into this process. Hence, if right after their higher secondary stage they are made to be prepared for learning the concepts as well as teaching, they will be better prepared teachers. Hence, the researcher traced out the need for preparedness to enter into teaching profession

right after higher secondary stage. It can be achieved through integrated teacher training programs. Therefore, the researcher took up a research one such integrated teacher training program called B.Sc. B.Ed. program of Navrachana University, Vadodara, Gujarat, India.

5.5.3. PROFESSIONAL DEVELOPMENT OF TEACHERS

The studies talked about the professional development of teachers. As per one of the findings, it was revealed that, there was a striking difference between the earlier specializations of the teachers and the subjects they had to teach like English, history and geography. [Lakdawala, U.T., (1977)]. Thus, the concept like B.Sc. B.Ed. program helps the teachers to be professionally prepared for teaching science only.

5.5.4. EFFECTIVENESS OF TEACHER EDUCATION/ TEACHER TRAINING PROGRAMS

The studies discussed about the status of the teacher education/training program and its effectiveness, in which it is revealed that there is a dire need for the content up gradation of the teachers, rigorous training and most importantly extended duration of training, which is only possible through integrated courses, since it provides a comprehensive knowledge of the subject matter as well as the teaching-learning theories.Hence, the researcher based on the findings of the studies has taken up the unique case study of B.Sc. B.Ed. program of Navrachana University, Vadodara, Gujarat, india.

5.5.5. Implications of Review of Related Literature

The researcher has undertaken a study titled, ‘A Case Study of B.Sc. B.Ed. Program of Navrachana University of Vadodara’. The very reason for the inception of the 4 year B.Sc. B.Ed. program was to generate better quality of teachers with strong professional training which was not possible with the regular 1 year teacher training program. The similar research has been done by Srivastava S and Manvadriya S (2008), ‘A Case Study of LokBharti, Sanosara, Gujarat, India’, in which the researchers have traced out the unique features of the institute which provides the better quality of teachers with a different curriculum transaction. The aim of any educational institution is to generate better quality of teachers who can uphold the teaching as well as non-teaching activities. But somehow, it is not possible with the

regular teacher training programs, as it does not ensure the professional development of teachers, as a result teachers transacts outdated information in the classrooms. The study related to the professional development of teachers has been done by Lakdawala, U.T. (1977) titled, 'The Professional Growth of Women Teachers of Secondary Schools of Greater Bombay', in which one of the findings revealed that there was not a single activity leading to professional growth performed by 50 percent or more of the teachers. The teachers were ready to take up unique courses but they were not willing to engage in any research activity. Therefore, professional development of teachers is a great challenge which we can overcome by introducing unique programs like B.Sc. B.Ed. and Lokbharti. Considering the effectiveness of the teacher training programs several studies have been conducted in which it was found that, there is dire need of organizing refresher courses, short-term intensive courses in special subjects, practical training, work-shops and professional conferences at both the levels (primary and secondary) of teacher education programs(Sharma. M. 1982). One of the finding revealed that quite a few teacher-educators were not adequately qualified to supervise teaching practice in the subject in which they were supervising the lessons. Also the practice teaching phase was quite short as schools do not proved adequate time, resulting into a poor quality of teachers and teaching methodology (Mohan K. 1980).

Therefore we can get a clear idea from the findings of different researchers that the major problems in the field of education are- no professional development of teachers; regular teacher training programs not sufficient to generate better quality of teachers resulting into a laidback attitude of teachers towards teaching profession and no up-gradation of the teacher training institutes in terms of curriculum, methodology and practical training provided to the student-teachers. Considering all the major findings, the researcher decided to take up a case study of unique program called B.Sc. B.Ed., so that the future researchers can conduct the similar studies in order to make people aware about the unique teacher training programs apart from the regular ones.

5.6. Rationale

India has experienced a major transition in terms of higher education system. Currently, the trend of traditional higher education system i.e. 10+2+3 has been challenged by the newly recognized and practiced trend of 10+2+5or4, which is termed as Integrated Program.

The Integrated Program is not a new concept in other countries and now-a-days in India as well. Many reputed Institutes like IIM and IIPM have incorporated such programs, as it is a whole new concept which guarantees all-round development of students.

Such programs have taken a slow but firm entry in teacher education programs viz. B.Sc. B.Ed.; B.A. B.Ed. etc. But, how far this program has proved to be successful in the universities of Gujarat? How is the curriculum designed? What are the difficulties faced by the functionaries? Many such questions are unanswered. Hence, the present research makes a brief attempt to answer several questions related to the Integrated Teacher Training Program in form of a Case Study of B.Sc. B.Ed. Program of Navrachana University of Baroda, Gujarat, India.

In the 21st century, all educators play a significant role in shaping the lives and careers of their students. When teaching and learning is at its best, our students, our communities; and our nation thrive. Educator preparation leaders are right to challenge themselves with the question: "What is our role in the changing landscape of 21st century knowledge and skills?" If educator preparation leaders come together to define and implement approaches that support the teaching and learning of 21st century knowledge and skills in more purposeful ways, we all benefit.

The American Association of Colleges for Teacher Education (AACTE) and the Partnership for 21st Century Skills believe new teacher candidates must be equipped with 21st century knowledge and skills and learn how to integrate them into their classroom practice for our nation to realize its goal of successfully meeting the challenges of this century.

West Virginia University – Transformational Innovation The College of Human Resources and Education at West Virginia University is gearing up to prepare educators for a global world. Responding to the immediate state and national needs for teachers prepared with 21st century skills and knowledge, the College is piloting a three-year, year-round teacher education program focused on providing a broad understanding of world regions and societies and an in-depth knowledge of pedagogy

and human learning. To accomplish this, the program includes three clinical experiences: one rural, one urban; and one international. Clinical rotations, utilized so that college faculty may visit top classrooms with their students, allow immediate discourse regarding best practices. Technology, used extensively throughout the program, includes 1) web cams, SKYPE, video conferencing; and more for observation and connectivity between pre-service candidates and teacher experts world-wide; and 2) gaming, social networking, Second Life and simulation technology to provide candidates with opportunities to network as teams, hone their classroom management skills as teacher avatars, and interact virtually with special students and those for whom English is a second language. Special Education and English language learning instructional skills are embedded in the program to support the needs of all 21st century students. Pedagogy, taught previously as separate skill sets, is combined into modules so that connectivity between content such as math and science is more apparent. The study of foreign language is encouraged. The goal is - World-ready educators, strong scholars eager to take charge of today's classrooms, in three years or less from admission to graduation. (AACTE, 2010)

The professional preparation of teachers is one of the most important social problems India is called upon to solve. The Education Commission (1964-66) too observed, 'Of all the different factors which influence the quality of education and its contribution to the national development, the quality, competence and character of teachers are undoubtedly the most significant'. An excellent education system does not happen by chance, but by knowledgeable, reflective, and socially just educators teaching a meaningful and relevant curriculum'.

If the schools are to prepare the youth with clear-cut ideals with desirable activities and attitudes the teachers must possess that clear-cut vision and must be equipped not only with scholarship but with the act of educating their pupils. The future of a younger generation depends on the quality of younger generation and this quality depends upon the quality of teachers. Unless the special measures are adopted for better teacher training programs and better quality of teachers then, not only the standard of the education but also the progress, prosperity and welfare of the nation will be threatened. In the same line, some of the findings of the studies revealed that the teachers are not adequately trained to take up the tasks related to teaching (Mohan k. 1980), which means the training imparted in the training institutes are not adequate. This issue has been reflected in one of the findings that the teacher education program

did not contribute towards the teacher attitude of the student-teachers (Devi, Laxmi. 1988). Certain conclusions can be drawn from these issues - Teacher's content knowledge is poor because of the conventional one year teacher training program. Moreover, the teacher education programs are designed improperly and focus is given only to the teaching pedagogy and therefore the content knowledge of the subject matter is compromised.

Therefore, in such circumstances there is a dire need for comprehensive four-year integrated teacher training program. One of the epitomes of such program is the Kurukshetra experiment which has been mentioned earlier. The Regional colleges of Education in Ajmer, Bhopal and Mysore, experimented such programs and it has been proved successful in upgrading the teachers and teaching competencies of teachers.

Many Commissions and Policies like The Chattopadhyaya Committee Report, Kothari Commission, NCTE innovations in teacher education report have suggested the introduction of four-year integrated teacher education program and UGC after the joint meeting with NCTE has formulated the consensus report and has successfully implemented such programs in several universities and colleges. In the same line, a comprehensive action plan has been made by NCTE on recommendations of Justice Verma Commission towards the four year program of D.Ed. after the completion of XIIth standard.

In the era of perpetual professional development, the policies and commissions are not sufficient enough to ensure the formulation of such unique programs. Hence it becomes inevitable to understand the importance of such programs by studying its unique curriculum, administration etc. Hence the researcher has taken up the case study of Navrachana University of Baroda, Gujarat, which provides the integrated teacher education program called B.Sc. B.Ed. program. The program is unique and is initiated by Navrachana University of Vadodara. Hence, it contributed as a major reason for the researcher to study about this unique program in detail.

The beneficiaries of this research will be the policy makers as the findings of the research can be helpful to them in order to govern new policies related to the curriculum and administrative aspects of such programs. Also the functionaries and teachers of the programs will be benefited as they can get some important guidelines from this research as to how to carry the entire program systematically without any haste. It will be a major help for the curriculum planners to develop a curriculum with an integrated approach. Most importantly, the students will be benefited from such

program as they can achieve the mastery over several disciplines along with teacher education. Therefore, the research will be helpful to the community as whole as trained teachers with vast knowledge of the subject matter and teaching pedagogy is a requirement of 21st century.

5.7. Statement of the Study

A Case Study of B.Sc. B.Ed. Program of Navrachana University of Vadodara, Gujarat, India

5.7.1. Explanation of the terms

Case Study: It is a "systematic inquiry into an event or a set of related events which aims to describe and explain the phenomenon of interest. While the method is applied retrospectively, the learning is used prospectively." (Bromley, 1990, p. 302).

By concentrating on a single entity or case (i.e. one child, one classroom, specific programme), the researcher is able to uncover the distinct characteristics of a phenomenon.

B.Sc.B.Ed. Program: It is an integrated four-year teacher education programme in Navrachana University, Vadodara, Gujarat, India.

5.8. Research Questions

Why was the B.Sc. B.Ed. Program introduced in Navrachana University?

How was the B.Sc. B.Ed. Program started?

What are the infrastructural facilities of the B.Sc. B.Ed. Program?

How is the administration of the B.Sc. B.Ed. Program of Navrachana University?

How is the curriculum designed and transacted in the Program?

What are the innovative aspects of the Program and how are these implemented?

What is the profile of the functionaries of the Program?

What are the perceptions of the functionaries, teachers and students about the Program?

How are the students going to benefit from the curriculum of the B.Sc. B.Ed. program?

5.9. Objectives of the Study:

In order to address some of the research questions, the following objectives are designed for the study:

4. To study about the following aspects of B.Sc. B.Ed. Program of Navrachana University-
    a. Objectives, Inception and Evolution of B.Sc. B.Ed. program.
    b. Profile of the functionaries of B.Sc. B.Ed. program.

5. To study the following aspects of B.Sc. B.Ed. program of Navrachana University-
    a. Infrastructural facilities
    b. Administrative aspects
    c. Curriculum and its transaction

6. To study the perceptions of the Functionaries, Academic Advisory Board members and Students (Present and former) on the B.Sc. B.Ed. Program, Navrachana University.

5.10. Methodology of the Study:

To achieve the objectives, a Case Study was conducted. This type of study allows an intensive analysis of an individual case; it is a methodological approach that allows the use of various instruments to understand the case in all its details.

5.11. Sample of the Study

Purposive sampling is generally used in a Case Study.

The sample of this study included - 10 Functionaries (teachers and a coordinator), 2 Academic Advisory Board members, 20 Students (Present and former) of B.Sc.B.Ed. Program of Navrachana University of Vadodara, Gujarat, India, for the academic years 2009-15.

5.12. Preparation of the tool

To elicit the required data, the method of triangulation was employed, that is using a number of research methods to draw together data from multiple sources in order to comprehend and confirm the findings. Thus, the tools for the Study were designed in accordance with the design of the study.

The following tools / instruments were used to collect data for the Study -

- Open ended and closed ended questionnaire
- Checklist
- Semi-structured interviews
- Telephonic interviews
- Document analysis.

For objective 1, ***documentary analysis*** was done. ***Semi Structured Interview*** was also conducted with the Chairperson of the University to know about the inception of the program and to verify the data obtained from documentary analysis. (List of questions are attached in Appendix 7)

In order to study the ***infrastructural facilities*** pertaining to B.Sc. B.Ed. program (Objective 2A), a checklist was prepared. It consisted of various aspects like – classroom facilities, library facilities, computer facilities, science laboratory and Language laboratory. A copy of checklist used in the study is enclosed in Appendix 4.

In order to study the ***administrative aspects*** of B.Sc. B.Ed. program (Objective 2B); a questionnaire was prepared with both open ended and closed ended items. It included various aspects related to the administration of B.Sc. B.Ed. program. A copy of questionnaire used in this Study is enclosed in Appendix 5.

In order to study the ***curriculum and its transaction*** (Objective 2C), a questionnaire was prepared with both open ended and closed ended items. It included various aspects related to how the curriculum was made and transacted in the classrooms and the uniqueness of the curriculum and its transaction. A copy of questionnaire used in this Study is enclosed in Appendix 6.

In order to study the ***perception*** of the Functionaries, Academic Advisory Board members and Students (present and former) on the B.Sc. B.Ed. Program, (Objective 3), a semi-structured interview schedule was prepared. The questions in the semi-structured interview schedule were framed differently for the functionaries (Teachers and Coordinator), Academic Advisory Board Members and present and former students of B.Sc B.Ed. program. List of these questions is enclosed in Appendix 7

In the process of preparation of the tools, major focus was on the utility of the tools as per the different objectives of the Study. The tool got structured after passing through different stages of validation

5.13. Validation of the tool:

In the second stage of preparation of the tool, the prepared tool was presented to five experts who were the professors of B.Sc. B.Ed. program (List enclosed in appendix 3).

Prior permissions were taken from the experts and the tool attached with a confirmation letter specifying the title and the objectives of the Study were presented to them (enclosed in appendix 2). The experts were requested to give their opinion and suggestion regarding the language of the tool (its lucidity, simplicity and correctness) and the content validity of the tool (how relevant was the information to the objectives under consideration).

Various suggestions were received from the experts, which were related to simplifying the language of questionnaire, adding few more aspects to substantiate the Study. Verbal as well as written comments were incorporated to modify the tool before proceeding ahead with the data collection procedure.

5.14. Data Collection

This section discuss about the manner in which data was collected in the field.

Stage1: Documentary Analysis

In order to collect information related to the objective 1 (Inception & evolution as well as profile of the functionaries of the B.Sc. B.Ed. programme) various documents pertaining to B.Sc. B.Ed. programme were collected and analysed.

Stage 2: Permission for Tool Administration

Access to the teachers, students and the coordinator was gained. Also, the permission for tool administration was attained (copy of permission letter is enclosed in appendix 1).

Stage3: Tool distribution.

Questionnaires were given to the teachers of B.Sc. B.Ed. programme.

Stage 4: Observation of Infrastructural Facilities.

Observational checklist was used by the investigator by visiting the university to acquire the data related to infrastructural facilities.

Stage 5: Data Collection

This stage was that of the actual data collection. It took several visits to the sample place to get the duly filled questionnaires from the teachers.

Stage 6: Conducting of the Semi-structured Interview

This phase involved the personal interaction with the teachers and Coordinator of B.Sc. B.Ed. program. Appointments were fixed at different dates for each teacher, in order to avoid any clash. The semi structured interview was then conducted as per schedule of the appointment taken.

Stage 7: Telephonic Interview with former students

In order to conduct telephonic interview of the former students of B.Sc. B.Ed. program, prior appointments were fixed with them on phone as per their convenience. The telephonic interviews with the former students were conducted on phone as per the schedule of the appointment.

Stage 8: Telephonic Interview with present batch of students

The investigator met present students of B.Sc. B.Ed. programme in the campus itself and took an appointment for the interview. Semi-structured interview was conducted with the present students in the hostel as per the prior discussion.

Stage 9: Telephonic Interview with Academic Advisory board members

Semi-structured interview with the members of Academic Advisory board was conducted. Semi-structured interview with the Chairperson of Navrachana University was also conducted.

It took 4 visits and some telephonic conversations for the investigator to get the proper responses for the semi structured interview. This gives a brief idea of the efforts made by the investigator to get authentic data for the Study.

5.15. Procedure of Data Analysis:

The data procured from various documents was analyzed qualitatively employing the technique of content analysis. The data obtained from the checklist was analyzed using the techniques of content analysis, and was interpreted as per the different criteria mentioned in the checklist. The information was read repeatedly, and was categorized into two categories for the interpretation of the data. The data obtained from the open-ended and closed-ended items in the questionnaires were analyzed using the technique of content analysis and percentage analysis (wherever required); the responses were further placed thematically in order to enable the interpretation of the data.

The data obtained from the semi-structured interview was analyzed using various steps. Firstly, write-ups were read carefully and notes were made. Then observations were bifurcated into interpretive categories. Basic themes were then determined based

on the responses made by the respondent. The newly determined themes were then fixed into the pre-decided themes. Percentage and frequency analysis was done for the semi-structured interview conducted with the students (present and former)

Thus, in the present chapter discussion about the methodology of the present study has been presented. The tools prepared and implemented in the field generated a lot of data needed for the present study.

5.16. Findings

Major findings of the study:

- B.Sc. B.Ed. programme was established in 2009 with the help of core curriculum committee and academic advisory board, who provided their valuable inputs for one long year. The Curriculum Core Group provided a month long orientation to the Faculty on integration among sciences and between Science and Pedagogy through varied interactive and hands-on experiences. Members of the Core Committee continue to provide rich inputs to the Faculty periodically.
- In 2010, the programme commenced. The programme got the government support to some extent. Although, the programme was open for all the people, more students from tribal area enrolled their name, as they applied for post-metric scholarships and similar other scholarships. Government boosted the programme by sending the names of tribal students for admission.
- Thus, the academic and curriculum committee did not only design the curriculum but also oriented teachers to understand how the curriculum needs to be transacted, since it is a unique programme. Also the teachers were oriented about the extra inputs that they have put in its transaction.
- In order to transact this unique curriculum the teachers with dual degrees in education and in sciences were identified. This shows the foresightedness of the core curriculum committee and the academic advisory board.
- The curriculum was designed considering its integrated effect. It was the amalgamation of both science as well as education. The content was not compromised at any cost, which is evident through the credit distribution structure of the programme, wherein 172 credit points are allotted to Science

and Mathematics and 72 credits to education, 24 to self development, 12 to language and 6 to research component.

- Thus, the students have broader options to pursue their higher education in whichever field they want. They can pursue their Masters in sciences as well as in education.
- The unique aspect of this programme was that the students were required to study all the subjects related to science. From semester I to Semester IV, it was mandatory for them to study Chemistry, Physics, Biology and Mathematics. It was in Semester V and VI; they were allowed select the electives between CBZ or PCM i.e. Chemistry, Biology and Zoology or Physics, Chemistry and Mathematics. It was only in Semester VII and VII that they were suppose to select a specialization from Physics, chemistry, mathematics, biology and zoology, along with the research component. Thus the curriculum was designed to prepare the students to become teachers of science and mathematics exclusively.
- Teaching methodologies emphasized the interdisciplinary nature of knowledge as against the fragmented nature of knowledge were encouraged. The different subjects were taught by the Faculty via activity based learning. Students were briefed on a topic and then asked to self-read the same topics for more in-depth information from the library/through internet/documentary films.
- Some of the modes of transaction adopted in the classroom were - group discussion, using library and ICT resources, use of video-clips in classroom teaching, *Laboratory work*, and observation in field sites followed by recording of these observations and experiences.
- Thus the unique features were- Incorporation of research which developed research acumen to be a better teacher, Amalgamation of teaching theories and fundamental science not only ensured better quality teaching skills, but also strengthened the knowledge, Extensive exposure, Trial and error method, Multidisciplinary inputs, foundation courses in IT and language, etc.
- Thus it was found that the teaching methods used were focused on merging the pedagogy as well as the content in order to give that integrated effect.

- Also it was found that in order to transact the curriculum in best possible way, various difficulties were faced by the teachers like lack of resources and time and coping up with the content and the credit structure.
- It was found that the administrative aspects of B.Sc. B.Ed. programme like- accreditation, admission criteria, mode of assessment and evaluation pattern were as per the NCTE norms.
- One of the major aspects of the admission criteria was also the acceptance of government scholarship for ST/SC students; hence most of the students belonged to ST/SC category, even though the programme was for all the categories.
- It was found that all the facilities like technologically advanced classrooms, Wi-Fi facility, language laboratory, computer laboratories, etc, were provided to the students. However, the programme faced monetary constraints in terms of managing laboratory expense like bringing chemicals, required apparatus for experiments, etc. Also the delayed government scholarship, managing the cost of practice teaching phase added to the monetary constraints faced by the programme.
- Managing and looking after each and every aspects of this unique programme was challenging for the coordinator as well as the teachers of the programme. Various challenges were faced by them like - inadequate funds for maintenance, less number of students enrolled, high fee structure, providing boarding and lodging facilities to students, etc. These challenges at times resulted into difficulties like - Implementing innovation despite inadequate supply and judiciously merging too many human and non human resources for that integrated effect.
- The major concern of the programme was getting the students for the programme. Major reason for not getting enough students was – Gujarat being a commercial state with people with business mindset. The students were more inclined towards popular fields like law, BBA, B.Com, Engineering, etc. Very few have interest towards teaching field and that too right after their H.S.C. and that too studying for for four long years.
- It was found that the university was technologically advanced in terms of providing facilities like complete terminals with internet, LCDs, OHP Slide,

Projectors, roll-down screens, green boards and podium for faculty and public address system.

- Also rich resources of books related to teaching of science specifically for B.Sc. B.Ed. programme. National/ International Periodicals and Journals, different packages, electronic media, thesis and dissertation etc, also enhance the classroom learning apart from the infrastructure provided. Stepping out from classroom learning which is also supported by learning through print and electronic material, practical experimentation is only possible in Laboratories.
- In order to gain hands on experience the university had dedicated laboratories for physics, chemistry and biology programmes which are well equipped with sufficient equipments, apparatus, specimens and computerized charts as per the requirements of every subject. In order to enhance the learning faster, the institute had well equipped central computing facility in computer labs.
- Since the students came from vernacular background, language was an important aspect for B.Sc. B.Ed. programme. In order to make them competent in listening, reading, writing and speaking skills, using technology to develop an understanding of concepts Language laboratories were established.
- Thus there were no issues related to the infrastructural facilities provided to the students.
- The teachers of B.Sc. B.Ed. programme found the four-year integrated teacher education having an immense capacity to generate world class teachers with expertise in content as well as teaching theories.
- It was found that the students were learning various concepts related to Science and then teaching the concepts in school. Hence, due to learning of the concepts and its continuous transaction in schools, the concepts become strong and various teaching-learning strategies can also be learned.
- In the path of making the students world class science teachers many challenges and difficulties had to be faced by the teachers like- making them understand scientific terminologies, making them techno-savvy, and most importantly bridging the gap between mathematics and biology subject.

- The challenges faced by the coordinator were- Getting teachers with M.Sc. M.Ed., getting the students for the programme and most importantly filling up the gaps between mathematics and biology.
- However the teachers were successful in their endeavors as the students were much more confident than they used to be at the initial stage. There is an overall change in their personality, knowledge, and acceptability. Each and every student have either joined school or doing M.Sc.
- The rigorous practice of the learning of concept as well as its transaction in school helped them to achieve content mastery, which ultimately helped them to crack competitive exams like Central Teacher Eligibility Test (CTET) and many such central and state level exams. Majority of them have cleared their CTET exam.
- Above all the scope of the programme emerges more and more with lack of competent science teachers. The programme trains the students to be a Science and Mathematics teacher as per the requirement of the school. They are 'ready available science teachers' for the schools.
- Thus it shows the comprehensive understanding of the teachers about the B.Sc. B.Ed. programme. And also the administrative efficiency of the coordinator.
- It was found that students joined the programme for various reasons and not out of their love and interest towards the profession. But after joining the programme they understood its worth.
- Various difficulties were face at the initial stage of the programme like- adjustment problems, language problem, unhygienic accommodation facilities, coping up with the subjects, etc. However, with the support of teachers they were able to overcome their difficulties.
- It was found that that there was a drastic change in them. They have become challenging, competitive and open. The programme helped them to learn how to engross the learner in the teaching-learning process effectively. Extra murals helped them to enhance the creativity within them. As a person, it helped them to be sensitive towards the needs of the society.

- The programme helped them to make their content stronger by constant drilling and also the combination of mathematics and biology subject helped them to achieve the competency in the subject matter.
- There is a drastic change in their personality. They have exceptional content mastery, they can now interact with proper eye-contact, and their stage fear has completely vanished.
- Today, they are confident enough to be financially stable anywhere they go. Also, they are confident enough to explain any topic with ease. They are competent science teachers in true sense.

5.17. Implications of the study:

Integrated Teacher education programme prepares the students to be a teacher with mastery over the subject matter along with the visionary acumen as concluded in the present study. Students of such programmes are important assets which satisfies the need of the school management to get the teachers with a broader understanding of the pedagogy as well as the teaching theories. The present study has its implications for all the stakeholders of Teacher education programme.

The present study projects the need for extended period of teacher education programme, which is possible primarily through government initiatives followed by the preparation of the curriculum by the curriculum experts and its implementation by teacher education institutes.

The present study describes one such successful case of integrated teacher education programme. The B.Sc. B.Ed. programme was introduced for the first time in Vadodara by Navrachana University. The study describes its success story in detail. It implies the outcome of such programmes in terms of better quality teachers with mastery over contents and deeper understanding of the educational field.

As established in the present study, the unique curriculum with more weightage to science, mathematics and education is a formula to generate competent science teachers. Apart from content and teaching theories, considering the need for language competency, research skills and personality development of the teachers, many aspects of it is incorporated in the curriculum and transacted successfully.

Thus the present study establishes the outcomes of four year integrated teacher education programme and its successful implementation.

5.18. Discussion

Discussions regarding improvement in teacher quality and teacher education are now widening. The recently initiated RMSA stresses the need to improve the access and quality of secondary education across the country. The efforts towards improving the elementary teachers' capacity building processes have highlighted the fact that similar efforts have not taken place for secondary and senior secondary teacher education and are urgently required. The RMSA proposes an organized attempt towards building capacity of teachers in secondary schools

In this, context the role of Colleges of Teacher Education (CTEs) becomes crucial, especially over the next 5 years. It is envisioned that CTEs play the major role in the field of secondary teacher education and development, also guiding the various secondary teacher education institutions in the districts under them. They have to see themselves as centres for developing excellence in secondary teacher education and in secondary classrooms at school. . In order to do so, an extended duration of the teacher education program is inevitable.

NCERT's experiments with the four year integrated program leading to the degree of B. Sc. Ed., two-year B. Ed. program and integrated M.Sc. Ed. are examples of extended integrated teacher education program. Similar innovations are also being tried out in other institutions across the country. Several initiatives for providing academic support to in-service teachers include the setting up of resource centres. Programs and activities of such centres include organization of workshops, provision of research fellowships and study sessions.

The present study also investigated one such case - The B.Sc. B.Ed. program of Navrachana university, vadodara, which aimed at meaningfully integrating content with pedagogy and prepare future Science Teachers with a science background together with specific training in science teaching related skills to engage their students in future in meaningful science learning.

5.19. Suggestions for further studies

The four year teacher education program is a unique concept which needs thinking minds, working hands and action-oriented attitudes. In order to foster such programs, the researchers can contribute by providing the theoretical support to the government as well as the educational institutes. Some research areas recommended by the investigator are as follows:

- Comparative study of institutes providing integrated teacher education programs, in order to know about innovative aspects of the curriculum of such program.

- Developing and implementing a curriculum of integrated teacher education program and test its effectiveness. This will help the curriculum planners to know the effectiveness of such programs so that they get idea from the research done.

- A sequence of case-studies describing the success stories of the integrated teacher education program will help the policy makers and curriculum planners to understand various aspects of such programs which make them successful.

- Comparative study of One year teacher education program and Integrated teacher education program

With the recommendation given for future studies it can be concluded that the teacher education plays a vital role in building a sound educational society. Hence, the limited duration of training is not enough to avail the teachers with exceptional knowledge base, and with great vision. The longer duration of the teacher education program with more exposure is today's need, so that the school learners get blessed with the teachers who can help them in making their fundamentals strong. The onus is on the educational society as a whole. Making policies concerning the integrated educational programs is not an end. It is a beginning towards a brighter future of the teachers as well as the students. The researcher lends the onus to other torchbearers in the field of educational research to contribute with in-depth researches related to Integrated Teacher Education Program.

BIBLIOGRAPHY

Manoharan, R. (2014). UGC wants Universities to Extend Integrated Courses Duration. *The Times of India*, Tamilnadu, India. Retrieved September, 2, 2014 from http://timesofindia.indiatimes.com/city/chennai/UGC-wants-universities-toextend-integrated-courses-duration/articleshow/39195710.cms

Joshi, B., Kalyanam, B. (2014). Experts Concerned over B.Ed. as NCTE Plans New Integrated Course. *The Indian Express*, Bangalore, India. Retrieved September, 2, 2014from http://www.newindianexpress.com/cities/bangalore/Experts-Concerned-Over-BEd-as-NCTE-Plans-New-Integrated Course/2014/04/19/article2177027.ece

Sneha. S. (2014, March). *One thought on "NCTE Teacher Training Course Integrated B.ed, Diploma"*. Retrieved September, 2, 2014, from http://www.examtojob.in/ncte-teacher-training-course-integrated-b-ed-diploma/

Gwang, K. (2013). *Case Studies on Integrating ICT into Teacher Education Curriculum in Asia*. ISBN. 978-92-9223-432-4. UNESCO Bangkok. Retrieved September, 2, 2014,from http://unesdoc.unesco.org/images/0022/002235/223520e.pdf

Anonymous, (2012, February 27). Integrated course proposed to improve training of teachers. *The Hindu*, Mysore, India. Retrieved August 29, 2014 from http://www.thehindu.com/todays-paper/tp-national/integrated-course-proposed-to- improve-training-of-teachers/article2936615.ece

Anonymous. (2012)., *what is a Literature Review?* Retrieved from http://www.engageinresearch.ac.uk/section_2/why_do_we_review_literature.shtml

S. Manavadriya., (2012), *A Case Study of Lok Bharti, Sanosara, Gujarat, India,* An unpublished M.Ed. thesis, M.S.U., Baroda, Gujarat, India

Restructuring and Reorganization of the Centrally Sponsored Scheme on Teacher Education- Guidelines for Implementation, (2012) Ministry of Human Resource Development, Department of School Education and Literacy. Retrieved 2nd September, 2014.

Bureau of Planning, Monitoring & Statistics. (2012). *Statistics of School Education (2010-11).* Ministry of Human Resource Development. New Delhi

Gujarat Literacy Rate, (2011). *Gujarat Population Census data 2011*, Retrieved April 25, 2015, from http://www.census2011.co.in/census/state/gujarat.html

Iyer. S., (2010), *Case Study of Nav-Prerna school – A School for the Less Privileged Children in Vadodara City*, An unpublished M.Ed. Dissertation, Navrachana University, Baroda, Gujarat, India

Rao, D. Pulla. (2009). Development of teacher education in India: an historical perspective. *Indian Journal of Training and Development*, volume no. 39, 51-59. Retrieved August 26, 2014 from http://hdl.voced.edu.au/10707/10763

National Curriculum Framework for Teacher Education. (2009). *Enhancing the status of Educational studies and the professional development of Teacher Educators*, New Delhi: Member-Secretary, National Council for Teacher Education.

National Curriculum Framework for Teacher Education. (2009). *Research and Innovation*, New Delhi: Member-Secretary, National Council for Teacher Education.

National Curriculum Framework for Teacher Education. (2009). *Urgency of Reforming Teacher education*, New Delhi: Member-Secretary, National Council for Teacher Education.

National Curriculum Framework for Teacher Education. (2009). *Exemplar of a Four- Year Integrated Programme,* New Delhi: Member-Secretary, National Council for Teacher Education.

National Focus Group. (2006). *Position Paper on Teacher Education for Curriculum Renewal*. National Council of Educational Research and Training, New Delhi

National Focus Group on Teacher Education for Curriculum Renewal. (2006). Position Paper. *Four year Integrated Programme of Elementary Teacher Education: The B.E.L.Ed., MACESE, Faculty of Education, University of Delhi (1994)*. National Council of Educational Research and Training (NCERT), New Delhi. Retrieved September 1, 2014.

Catherine, S., Sara, H., Julia, E. (2005), Meaning of the word Integration, *Pocket Oxford English Dictionary, Tenth Edition*, Oxford University Press, University of Oxford, New York, U.S.A. Retrieved on August 29, 2014.

Cheney, G.R., Ruzzi, B.B., & Muralidharan, K. (2005). A Profile of the Indian Education System: *Paper prepared for the New Commission on the Skills of the American* Workforce. National Center on Education and the Economy

Altbach, Philip G. (2005). *Higher Education in India,* The Hindu, April 12, 2005.

Dibakar,S. (1992)., A Study of Four Year Integrated Teacher Education Programme in India, An unpublished PhD thesis, *Centre of Advanced Study in Education, M.S.U.*, Baroda, Gujarat, India.

Bromley. (1990). *Definition of Case-study*. Retrieved April 14, 2015 from http://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1001&context=nursin g_faculty_pubs

Devi, Laxmi., (1988), *Evaluation of the Teacher Education programme of Agra University*, An unpublished PhD thesis, Fifth Survey of Educational Research (1988-92), Volume II, N.C.E.R.T., Delhi Sharma, M., (1982), *Progress and Problems of Teacher Education in India*, An unpublished PhD thesis, Third Survey of Research in Education (1978-1983), N.C.E.R.T., Delhi

Aggarwal, J.C. (1984), *Landmarks in the History of Modern Indian Education*, p. 140-142. Vikas Publishing House Pvt. Ltd., New Delhi, Reprint 2003. Retrieved on August 27, 2014.

Chattopadhyaya. *The Teacher and Society. Chattopadhyaya Committee Report (1983- 85),* MHRD, GOI. pp.48, Retrieved September 1, 2014.

Aggarwal, Y.P., (1980), *Motivational factors in the choice of teaching as a profession and its relationship with some other variables,* Third Survey of Research in Education (1978-1983), N.C.E.R.T., Delhi

Bhandarkar, B.G., (1980), *A Study on Polytechnic Teachers Attitude Towards Teaching Profession and Its Correlates,* Third Survey of Research in Education (1978- 1983), N.C.E.R.T., Delhi

Mohan. K., (1980), *Effectiveness of Teacher Training Programmes, An unpublished PhD thesis,* Third Survey of Research in Education (1978-1983), N.C.E.R.T., Delhi

Sinha. U., (1980). *The Impact of Teacher Education Programme on the Professional Efficiency of the Teachers,* An unpublished PhD thesis, Third Survey of Research in Education (1978-1983), N.C.E.R.T., Delhi

Lakdawala, U.T., (1977). *The Professional Growth of Women Teachers of Secondary Schools of Greater Bombay,* Third Survey of Research in Education (1978-1983), N.C.E.R.T., Delhi

Marker, N.S. (1975). *Survey of Teacher Education in the State of Maharashtra, An unpublished PhD thesis,* Third Survey of Research in Education (1978-1983), N.C.E.R.T., Delhi

Dr. Dr. D.S. Kothari, (1966). *Indian Education Commission 1964-66*. New Delhi: NCERT. Retrieved on 2nd September, 2014.

Educational Scenario of Gujarat, *Department of Education*, retrieved on April, 25, 2015 from http://www.gujaratindia.com/about-gujarat/about_gujarat.htm

APPENDIX 1

PERMISSION LETTER

Date: 14/12/14

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. POOJA P. SHAH is a M.Ed. student (Master of Education of our University. As a part of the curriculum requirement, this student is expected to complete her dissertation on: A Case Study of B.Sc. B.Ed. Programme of Navrachana University of Vadodara, Gujarat, India based on the data collected with your support.

I request you to allow her to visit your institution to undertake her data collection / observation / implementation and discussion which will support in her dissertation work.

Please give the necessary support!

Principal,

Dr. P.V. Xavier

APPENDIX 2

REQUEST LETTER TO VALIDATE THE TOOLS

To

Dr.

Faculty of Science and Education,

Navrachana University,

Vadodara.

Date: - 3/12/2014

Subject – Request to validate the tools

Respected Sir / Madam,

I, Ms. Pooja Shah, am a M.Ed. student. As dissertation is a compulsory part of M.Ed. curriculum, my research topic is, "A Case Study of B.Sc. B.Ed. programme of Navrachana University of Vadodara, Gujarat, India." I have developed tools as per the objectives of the study. I request to validate the tools. I have attached a brief write-up stating the Title of the Study, Objectives of the Study, clarification of terms and sample of the study. I have also attached the tools.

I kindly request you to review the tools and give feedback.

Thanking you,

Yours Sincerely,

Ms. Pooja Shah

Id – 14561007

Masters of Education 2014-15,

Navrachana University.

APPENDIX 3

List of five experts for tool validation

1. Dr. Elizabeth Robin
   - Designation : Assistant Professor
   - Qualification : M.Sc. (Botany), Ph.D. (Botany)
   - Area of Interest : Phytochemistry, Taxonomy, Medicinal Plants

2. Dr. K. Poonam Kumar
   - Designation : Assistant Professor
   - Qualification : M.Sc. (Organic Chemistry), Ph.D. (Chemistry)
   - Area of Interest : Synthetic Organic Chemistry, Pharmaceutical Chemistry

3. Dr. K. S. Kumar
   - Designation : Assistant Professor
   - Qualification : Ph.D. (Chemistry)
   - Area of Interest : Analytical and Environmental Chemistry

4. Dr. Darshee Baxi
   - Designation : Assistant Professor
   - Qualification : M.Sc. (Zoology), Ph.D. (Zoology)
   - Area of Interest : Endocrinology, Diabetes, Stress.

5. Dr. Pramila Ramani
   - Designation : Assistant Professor

Qualification : M.Sc. (Mathematics), M.Ed., NET, Ph.D. (Education)

Area of Interest : Research Methodology, Psychology, Philos

APPENDIX 4

OBSERVATIONAL CHECKLIST

Objective II (A): To study the infrastructural facilities of B.Sc. B.Ed. programme of Navrachana University

CRITERIA	**Yes**	**No**	**Remarks**
Classroom Facilities			
Classrooms are adequate in number			
Classrooms are spacious			
Each class has Blackboard/Green Board			
Each class has a functional projection system for presentation and seminar			
Seating arrangement in circle for group discussion			
Library Facilities			
Library has book racks arranged properly as per different sections			
Books related to the subjects of the programmes are available			
Thesis and Dissertations are adequate in number			
Journals and magazines are maintained separately			
Computer facility is available in library			
E-resources are available for wider knowledge			

Computer Lab			
Adequate number of computers are there in computer lab			
Computers are in working condition			
Wi-Fi facility is available			
Required software are there			
Science Laboratory			
Required apparatus available for conducting of experiments- • At undergraduate level? • At school level?			
Language Laboratory			
Required equipment are there to support language learning			
It helps in enhancing their language competencies given the fact that they come from vernacular backgrounds			
Required software are available			
Additional efforts/gadgets available if any to help these students			

APPENDIX 5

OPEN ENDED AND CLOSED ENDED QUESTIONNAIRE

Objective II (B): To study the administrative aspects of B.Sc. B.Ed. Program of Navrachana University.

[Note: The questionnaire is solely for the research purpose and the researcher assures that it will not be manipulated. Hence, the respondent is requested to respond honestly]

General Information

Name :

Qualification :

Designation :

1. Who were the members of Academic Advisory Board of B.Sc. B.Ed. Program? (Please mention their Designation)

   _____

2. What were the criteria for giving admission to B.Sc. B.Ed. Program?

   _____

3. How was the mode of assessment? Please mention if any other.

   □ Traditional

   □ Innovative

   □ Both

   _____

4. How was the evaluation system of B.Sc. B.Ed. program?

   _____

5. Does the program get any Government aid? Does it accept Government scholarships? If yes, then which types of scholarships are accepted?

   _____

6. Were adequate facilities provided to ensure innovative methodologies?

   □ Yes □ No

   If yes, please justify.

   _____

7. How did you ensure enrichment in academics?

   _____

8. How were the various components incorporated within the timings of 9:00 am to 5:00 pm?

   _____

9. What challenges were faced in administration of B.Sc. B.Ed. Program?

_____

APPENDIX 6

OPEN ENDED AND CLOSED ENDED QUESTIONNAIRE

Objective II (C): To study the curriculum and curriculum transaction of B.Sc. B.Ed. Program of Navrachana University.

[Note: The questionnaire is solely for the research purpose and the researcher assures that it will not be manipulated. Hence, the respondent is requested to respond honestly]

General Information

Name :

Qualification :

Designation :

1. Who were involved in designing the curriculum of B.Sc. B.Ed. Program? (Please mention their Designation)

   _____

2. What factors were considered while designing the curriculum of B.Sc. B.Ed. Program?

   _____

3. Please mention the details of the Program structure (credit structure) of B.Sc. B.Ed.

   _____

4. What innovative measures were typical to four year Program?

   _____

5. What were the practical aspects covered under B.Sc. B.Ed. Program?
   - Industry visit
   - Field visit
   - Others (please mention)

   _____

6. How was B.Sc. B.Ed. different from the conventional 3 years of B.Sc. and 1 year of B.Ed.?

   _____

7. How were the pedagogy and the teaching theories merged together?

   _____

8. What were the teaching methods used by the teachers in transaction of the curriculum?
   - Teacher Centric
   - Student Centric
   - Others (please mention)

   _____

9. What were the problems faced by the teachers in the transaction of the curriculum?

   _____

10. What was the unique feature of the curriculum that helped the students to be a better teacher?

_____

11. Was there any up gradation made in the curriculum?

□Yes □No

If yes, then what up gradation were made?

_____

APPENDIX 7

SEMI-STRUCTURED INTERVIEW SCHEDULES

Objective 3: To study the perceptions of the Functionaries (Teachers and Coordinator), Academic Advisory Board Members and Students (Present and former) on the B.Sc. B.Ed. Program of Navrachana University.

Perception of teachers on B.Sc. B.Ed. Program:

General Information

Name :

Qualification :

Designation :

i. As a teacher how do you see B.Sc. B.Ed. Program?
ii. How is it helpful for the students?
iii. What teaching difficulties have you faced?
iv. What were the challenges faced by you?
v. Did you find any learning difficulties in students?
vi. What is the scope of the Program?
vii. What changes did you see in the students after completion of the Program?

Perception of Coordinator on B.Sc. B.Ed. program

Name :

Qualification :

Designation :

i. As a teacher how do you see B.Sc. B.Ed. Program?
ii. How does the program mould the students to become a better teacher?
iii. What challenges did you face in the functioning of the Program?
iv. What is the scope of the program?

Perception of Academic Advisory Board members on B.Sc. B.Ed. program

i. What are the innovative aspects of the program?
ii. What challenges do such programs face?
iii. What is the scope of the program?

Perception of students (present and former) on B.Sc. B.Ed. Program:

General Information

Name :

Year of passing :

i. What was the reason for joining this Program?
ii. Did the subjects of B.Sc. B.Ed. help you in making your content stronger? How?
iii. What difficulties did you face at the initial stage of the Program?
iv. What innovative things have you learned in B.Sc. B.Ed., which you learned nowhere in your life?
v. How did the Program help you to be a better teacher and most importantly a better person?
vi. Do you find some improvements in yourself? In which area you find improvements?
vii. Did the Program help you to be financially independent?
viii. Please give your valuable suggestions for the improvement needed (if any) for the Program.

APPENDIX 8

LIST OF CORE CURRICULUM COMMITTEE

List of Core Curriculum Committee of B.Sc. B.Ed. programme

Prof. T. K. S. Lakshmi	: Former Dean, Faculty of Education, Banasthali University, Rajasthan
Dr. T. V. Ramchandra	: Head, Energy and Wetlands Research Group, Centre for Ecological Sciences, Indian Institute of Sciences, Bangalore
Dr. Subramanyam	: Former Joint Director, Directorate of Technical Education Karnataka State
Dr. V. D. Bhat	: Dept. of Education, Regional Institute of Education Mysore
Dr. Arun Kumar	: Head, National Institute of Technical Teachers' Training and Research, Extension Centre, Bangalore.

APPENDIX 9

PROFILE OF THE TEACHERS

Core Faculty

1. Dr. Mandira Sikdar

Designation	:	Associate Professor (B.Sc. B.Ed. Program Coordinator)
Qualification	:	M.A., M.Ed., Ph.D. (Primary Education)
Area of Interest	:	Primary Education

2. Dr. Darshee Baxi

Designation	:	Assistant Professor
Qualification	:	M.Sc. (Zoology), Ph.D. (Zoology)
Area of Interest	:	Endocrinology, Diabetes, Stress.

3. Dr. Elizabeth Robin

Designation	:	Assistant Professor
Qualification	:	M.Sc. (Botany), Ph.D. (Botany)
Area of Interest	:	Phytochemistry, Taxonomy, Medicinal Plants

4. Dr. K. Poonam Kumar

Designation	:	Assistant Professor
Qualification	:	M.Sc. (Organic Chemistry), Ph.D. (Chemistry)
Area of Interest	:	Synthetic Organic Chemistry, Pharmaceutical Chemistry

5. Dr. Pramila Ramani

Designation	:	Assistant Professor
Qualification	:	M.Sc. (Mathematics), M.Ed., NET, Ph.D. (Education)

Area of Interest	:	Research Methodology, Psychology, Philosophy

6. Dr. Shilpa Popat

Designation	:	Assistant Professor
Qualification	:	M.Sc. (Chemistry), M.Ed., NET, Ph.D. (Education)
Area of Interest	:	Educational Psychology, Research Methodology, Organic Chemistry

External Faculty (School of Engineering and Technology)

1. Dr. K. S. Kumar

Designation	:	Assistant Professor
Qualification	:	Ph.D. (Chemistry)
Area of Interest	:	Analytical and Environmental Chemistry

2. Ms. Sneha Patel

Designation	:	Assistant Professor and Head of Department (Electrical and Electronics Engineering)
Qualification	:	M.Tech. (Electrical Engineering)
Area of Interest	:	Power Electronics Converters & Drives, Power Quality, Embedded Systems

3. Dr. Pallavi Ghalsasi

Designation	:	Associate Professor
Qualification	:	Ph.D. (Indian Institute of Science, Bangalore)
Area of Interest	:	High pressure effects in materials probed by Raman and infrared spectroscopy, Novel material.

4. Dr. Sandeep R. Patil

Designation	:	Assistant Professor
Qualification	:	Ph.D. (Chemistry), P. G. Diploma in Patents Law
Area of Interest	:	Phase Studies of Micro emulsions, Micro emulsions as Templates for Synthesis of Nanomaterials, Surfactant Ion Selective Electrode and its Applications

APPENDIX 10

LIST OF PRINT JOURNALS/PERIODICALS SPECIFICALLY RELATED TO B.SC. B.ED. PROGRAMME

1. Anweshika (National Council for Teacher Education)
2. Bhartiya Adhunik Shiksha
3. Current Science
4. Down to earth
5. Education dialogue (Contemporary Education Dialogue)
6. Edutrack
7. Indian Educational Review
8. Journal of educational planning and administration
9. Journal of Indian Education
10. New frontiers of education
11. Prathmik Shikshak
12. Primary Teachers
13. Resonances
14. School science (School Science Review)

15. Science reporter
16. Social change
17. Teacher plus

APPENDIX 11

LIST OF ACADEMIC ADVISORY BOARD MEMBERS OF B.SC. B.ED. PROGRAMME

1. Prof. Shyam B. Menon	: Vice Chancellor, Ambedkar University, Delhi
2. Prof. D.R.Goel	: Chairman, National Council of Teacher Education, Western Region Council, Bhopal
3. Prof. B.B.Chattoo	: Director, Genome Research Centre, MSU Baroda, Former Vice Chancellor, Mata Vaishnodevi University, Jammu
4. Prof. Mammen Daniel	: Former Dean, Faculty of Science, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat
5. Prof. T.K.S.Lakshmi	: Former Dean, Faculty of Education, Banasthali University, Rajasthan
6. Mrs. Rekha Mishra	: Principal, Navrachana Vidyani Vidyalaya, Vadodara