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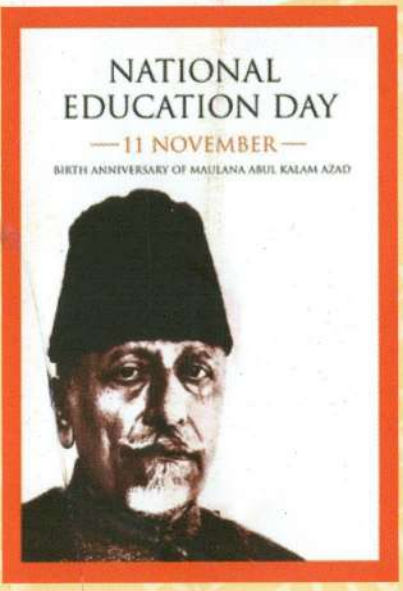

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Dear Readers!

Recognising the significant services of MaulanaAbulKalamAsad, who was the first education minister of the Independent India from 15 August 1947 until 2 February 1958, we celebrate his birth day, namely 11 November as National Education Day of India every year. As an academician and freedom fighter, he had a deeper understanding of the fundamental role education played in the development of the nation; hence he gave impetus to literacy. "We must not for a moment forget, it is a birth right of every individual to receive at least the basic education without which he cannot fully discharge his duties as a citizen" (Maulana AbulKalam Azad, 1948). Not only did he lay emphasis on elementary education but also propagated diversification of secondary education and vocational training.

Maulana was a freedom fighter, journalist, and reformer and committed to building a nation through education. His contribution to the cause of education in India is vast and noteworthy. During his tenure in the Education Ministry Maulana promoted research in eastern learning and literature and set up institutions in fine arts such as SangeetNatak Academy, Sahitya Academy and Lalit Kala Akademy. Interestingly some of the important institutions and commissions of today's India such as University Grants Commission (UGC), All India Council for Technical Education (AICTE), Indian Institute of Technology, Kharagpur, JamiaMilliaIslamia, The University Education Commission, and The Secondary Education Commission were established by him. He strongly advocated education for women and free and compulsory primary education for children up to the age of 14.

As we celebrate his birthday as national education day, we need to reflect on progress of his dreams and the relevance of his achievements and life for our times. How far his vision of free basic education has been reached? Have we made the standard and quality education at the level of primary, secondary and higher, available for the rural and poor?Out of 561 million literates in the country, 145 million literates are educated only up to 'Below Primary' level and another 147 million up to 'Primary' level. Number of literates educated up to these two levels account for 52 % of the total literates in the country(Census India,2001). This indicates that we have to double up our efforts in enrolling the maximum in secondary as well as higher education. A big junk of rural folk become dropouts after primary, not able to reach even the secondary which is a sorry state of affairs. Though we can boast of bringing down the total number of illiterates in 2011 census, we ought to raise a pertinent question whether a quality education is offered to all, especially in rural area as they are the most neglected citizens of our nation. Let us resolve, as educationists and nation builders, that we would strive our best to offer a quality and equitable education wherever we are so that our people remain critical of all the societal structures and choose the best for their fruitful living.

We have a variety of research papers and articles for your critical reading as usual and invite you to respond to them in your own way. We welcome your feedback and contributions in order to continuously rejuvenate the journal for its better meaningful existence.

Thanking you for your support
Editorial Team

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CONTENT

EMERGING QUALITY AND MANAGEMENT ISSUES OF INDIAN TECHNICAL EDUCATION SYSTEM

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ABSTRACT

Education serves as the capital of a society. In the present scenario, education provides humans with a better chance of living, which in turn leads to a better lifestyle, employment and status. The educational journey of India during the last seven decades after independence has been quite exciting. The growth in the area of technical education has also been rather impressive but requires a qualitative shift. The higher Education World Reputation Rankings is based on several quality parameters carrying high weightage in methodologies of universities ranking indexes basis on teaching, knowledge transfer, research, patents, placement and international outlook. None of the Indian universities failed to qualify for the top 100 universities in the world.

The system is also failed to fulfil market needs, a curriculum that is of low relevance to employment needs. To achieve this goal, the centres of technical learning should be prepared by regularly changing/ updating their curriculum to the market/society requirements to increase the employability of technical education seekers. A modern education management system should maintain issues that cross states boundaries, and adjoined whole nation on ecological, cultural, economical, political and technological grounds such as the Globalization program which draws upon expertise in many areas of technology. Major education reforms are long overdue. Only then can India become a global educational hub, as it once was.

Keywords: *Globalization, Management, Technical Education, Universities ranking indexes.*

Introduction

Technical Education has attained a key position in the knowledge society under globalised economy was introduced into India by the British. In the current scenario, our technical education policy faced immense challenges by Individuals, Institutions, Systems and Societies due to ample of problems, in the context of various other factors that are simultaneously operating on the technical education system. If one looks into the reasons for the lagging of technical institutions in quality issues, few questions arise — is it because of lack of professional research by the faculty, lack of modernized applied curriculum, financial support and infrastructure, lack of professional faculty, lack of academic freedom, excessive bureaucratic Interference, so on. The present structure of technical education is not only outdated but is also inherently weak and unequal to the task.

Present Scenario of Technical Education In India

The Eleventh Plan envisages setting up of 8 new IITs, 6 new IIMs, 10 new NITs, 3 IISERs, 20 IITs and 2 new SPAs. In establishing these institutions, the scope for Public-Private Partnership (PPPs) explored. Several selected technical institutions will be upgraded subject to their signing MOU on commitments to making reforms in governance structure, BOG creation, admission procedure, etc. and aligning with the character of the national institutions.

Now in India have more than 2900 undergraduate level engineering institutions approved by AICTE with an intake of about 10 lakh students. It is believed that there is an excess supply of unemployable engineers. As per NASSCOM study, about 24 % of total graduates engineers passing out every year are employable in multinational companies and the rest of these have to undergo advance training to overcome their skill deficit. Technical Institution

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has increased the number of students and teaching Faculty employed making India's system of technical education the second largest in the world this improvement, keeping the structure as it is, will certainly not yield the desired outcomes. The advance technical learning institutions reach out to the students to fulfil their dreams by regularly framing and updating the curriculum. The point of contradiction or the larger problem in recent days is that students are not being market-ready even after completion of their courses.

Some of the IITs/NITs/ Universities have started finishing schools to bridge the skills gap of their students. In Big cities, multinational companies have come forward to organize finishing schools for the students of the self-financing engineering colleges in specific areas like JAVA, VLSI Design, Embedded system, computer added SAP, Advance computing etc. of 6 to 12 months duration to make these students employable.

Technical education has profoundly changed in the past two decades, and those involved in the academic enterprise have yet to grapple with the implications of these changes. Academic institutions and systems have faced pressures of increasing numbers of students and demographic changes, demands for accountability, reconsideration of the social and economic role of technical education

Keeping Pace with Global Education systems

Now a day, technical education reshaped from national education to global education, from 'teacher-centric education to learner-centric education, due to huge migrations of a student from one country to others. Technical education allows students to excel in their dreams of becoming entrepreneurs, scientists, academicians, bureaucrats, writers and activists. Huge numbers of young professionals throng universities every year to make their dreams come to real shape. While technical education is thus challenged by the grassroots and by the indigenous culture, it is also relentlessly pressed to keep pace with global advances, in the development of both manpower and research.

Quality in technical education is a holistic concept. Thanks to AICTE for the awakening it has brought about among more than a thousand technical institutions of learning in our country which has reset their goals, diversified curricula and improved methods of teaching, evaluation and learning after the first round of institutional assessments made.

In engineering courses, the modernizing of the curriculum is the need of the day, to meet industry requirements. Understanding the latest theoretical knowledge, developments, scientific and statistical tools and techniques makes students market-ready giving them the confidence to try their hands at diverse fields.

Global Challenges

Indian technical education has a world leader from a long tradition. Takshshila and Nalanda date back two thousand years ago. However, the modern Indian system faces similar contemporary challenges, resulting from the advancement of science and technology, economic growth, social changes, and the internationalization and globalization of the world economy.

Public spending on education by governments in India amounts to about 3.6% of the GDP of which that on higher education is 0.6%, that is, approximately USD 2.7 billion in one year. Nearly 100,000 professionals leave India each year, which brings the resource loss to approx. USD 2 billion a year. This is an unavoidable circumstance requiring urgent curative measures.

This transition has led to a series of vast socio-economic changes and has had a strong effect on society. Need of overspecialized and departmentalized technocrats and labour forces based on the rationale of a planned education system suitable for the future developing market context.

Thus need of rigid central planning system of governance and administration and to establish a new educational institutional framework and operating mechanism. This is a tremendous task, encompassing a series of reforms, which includes breaking the departmental boundaries between different government agencies that segmented the technical education system, to grant institutions more autonomy and enable them to respond to the needs of socio-economic development as signalled by the labour market, rather than as dictated by government

planning. Globalization leads to challenges and threats also. The major concern is to deliver advance level education with updated curriculum and practical arrangement. This is possible only by attracting talented & experienced faculties.

The link between Technical Education and Workforces

How to improve the link between education and the workforce represents a serious challenge for the technical education system that is changing, although it is still functioning to some extent. More autonomy required for faculties to direct control and management to one of regulating universities within an infrastructure and financing technical education with priorities, providing policy guidance and coordination, and monitoring and evaluating technical education institutions.

To Emphasize on Management of socio-economical development by technology

The strong impact of advances in information technology on the school-to-work transition, lifelong education, distance education etc., To equalize access, the bottom line of the government's policy is to provide opportunities for technical education to all those who aspire to it. To serve these situations, facilities have been massively expanded. Fees have been kept low. The MOOC program through NPTEL and Swayam portal has been introduced as the media of online learning's. Several universities offer fee waivers to economic backwards students. The UNDP Report, 2000 emphasized the linkage between human rights, human development and inclusive democracy. The emphasis is, therefore, on a human rights-based approach to development and poverty eradication on the global agenda. Education institutions are exposed to the various interests of different stakeholders, viz. government, labour market and funding agencies.

Quality Improvement Programme

There are various schemes/ programmes such as the Technical Education Quality Improvement Programme (TEQIP) and Third Technician Education Project assisted by the World Bank, which are engaged in bringing out systematic improvements in the technical education sector. The programme was launched by the Ministry of Human Resource Development, in December 2002. The objective of different TEQIP program viz. I/II/III aims at uplifting and supporting the efforts of the Government of India. By improving quality of technical education and enhancing existing capacities of the Institutions to become dynamic, demand-driven, quality conscious, efficient and forward-looking, responsive to rapid economic and technological developments occurring both at national and world levels.

SWOT analysis of the Indian Technical education system

Strength

Very good Software knowledge and Technocrat which provides a very strong base. Indian education system moulds the growing minds with a huge amount of information and knowledge. India has got a very impressive and learned education history.

Weakness

Lack of adequate up-gradation of the curriculum. No benchmark and no common course content and no common exam procedure national wide are the major weakness of Indian technical education system.

Opportunities

In India, there are a large number of technical education institutions. Therefore, we can produce more and highly qualified young learners. Fulfilling student's demands by providing the best quality of education. Producing enough number of technically skilled outputs. By making more advance Curriculum should be made more realistic and practically biased and employable.

Threats

The threats of Indian technical education system are Deteriorating quality standards of education institutions, Lack of interest and interaction from the industry in developing and collaborating in the research field, Loss of quality standards and Lack of teamwork.

The Pressure of Numbers and the Decline in Quality

Education institutions are exposed to the different interests of various stakeholders, such as government, labour market and funding agencies. Now the number of students increased with massive populations but facilities fall short of demand. In Madhya Pradesh, various professional programs generate a huge number of graduates with unemployability; lack of competition. To meet the

demand, facilities are constantly stretched beyond capacity. As a result, quality suffers. When classes were small, teachers were able to encourage questions and stimulate interaction, despite teaching by the lecture method, extensively used in the country. But now, as they lecture to large numbers, this is no longer possible. The Government must, in all seriousness, draw up a plan and programme of action, allot the necessary funds under the mission "Reconstruction of Technical Education," and implement it in three successive five-year plans.

Conclusion and Recommendations

The traditional education into particularly in the faculties of the arts, commerce, and science has become largely irrelevant to the knowledge and skills needs of society. It reveals that technical education needs to be in close touch with the world of work and to interact with it meaningfully. All technical institutions must have autonomy for academic, administrative and financial; Partnership between industries and technical institutions should be encouraged and promoted; Institutions should have freedom and motivation to generate additional financial resources through research, consultancy, continuing education etc. To match these requirements, the centres of higher learning should be prepared by regularly changing and updating their curriculum to the market/society requirements to boost the employability of higher education seekers.

- The requirement of increased in student fees to some extent, in consultation with student bodies and parents' organizations.
- Encouraging accountability at various levels of decision making. Promoting income tax inducement for obtaining donations.
- Reorientation of educational programmes.
- Linking education with employment.
- Industry linked human resource development programmes.
- Reorientation of the management system of Colleges and Universities.
- Better allocation/utilization of the resources already available desired for better systems.
- Technical institutions should be internationalized by developing linkages and partnership with international agencies for the various programmes and services offered by the institution;
- Communication through satellite for continuing engineering education program will help a large number of countrymen in getting informed about the latest development taking place in the world.

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GENDER-BASED STUDY ON CRITICAL THINKING ABILITY AMONG TEACHER EDUCATORS-A COMPARATIVE ANALYSIS

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ABSTRACT

Critical thinking is an important skill that promotes self- reflection in our work. The present study was conducted to understand the impact of gender on the critical thinking ability of teacher educators. The total number of teacher educators was 30 which were selected from three Universities of Gandhinagar, out of which 16 were males and 16 were females. A self- developed test was used to test the critical thinking ability of teacher educators. The findings of the study showed that there is no impact on Gender on Critical Thinking. Hence, the study gives direction towards designing classroom pedagogy for teacher education based on critical thinking and towards further researches that need to be carried on under this domain.

Keywords:- *Critical Thinking, gender, teacher educators.*

Introduction

In ancient India, education and religion were closely linked to each other. The character formation with the proper development of the moral feeling along with preparing students to become a useful member of society was an important aim of education during that time. In the classical Indian handbook of Ayurveda called Charaka Samhita, the author Acharya Charaka said following words, "One who has acquired the knowledge (given by the authoritative text) based on various reasons and refuting the opponent's view in debates, does not get fastened by the pressure of opponent's arguments nor does he get subdued by their arguments" (Vaidya, 2016). According to Nagasena, "When scholars talk a matter over one with another, then there is a winding-up, an unravelling, one or other is convicted of error, and he then acknowledges his mistake; distinctions are drawn, and contra-distinction; and yet thereby they are not angered" (Vaidya, 2016). The National Curriculum Framework (2005) also visualizes teachers in the role of "facilitator who encourages learners to reflect, analyze and interpret in the process of knowledge construction". It also recognizes the fact that a sensitive and informed teacher is one who "can engage children through well-chosen tasks and questions so that they can realize their developmental potential". The NCF, 2005 also suggests that student-teachers, teacher educators or regular teachers should critically examine the curriculum, syllabi, and textbooks regularly.

Critical Thinking is one of the important skills which is much discussed in the field of Teacher Education. The National Curriculum Framework for Teacher Education, 2009 recommends teachers to critically engage with the theory and practice for developing a professional approach in the process of teacher education. The relevance of Critical Thinking can be understood going back to the era of Socrates where he emphasized seeking reasons, obtaining evidence, questioning assumptions and analyzing concepts to justify one's claim. To understand the significance of Critical thinking in the field of teacher education, it is important to understand its meaning and definition given by various philosophers. John Dewey defines critical thinking as "active, persistent and careful consideration of a belief or supposed form of knowledge". From being active, he meant the active involvement of the individual in the process of knowledge construction rather than learning passively from somebody. Building on the idea of Dewey, Edward Glaser, co-author of one of the widely used tests of critical thinking adds more emphasis to the evidence-based inquiry.

According to Mason (2008), Robert Ennis (1996) propagates the idea of critical thinking to be based on skills such as becoming reasonable and a reflective thinker in the

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work one chose to do. McPeck (1981) argues that critical thinking is specific to a discipline that depends on a thorough knowledge of the subject content.

Teacher Educators are required to be flexible and reflective, innovative, dynamic in their responses where they can locate, map and translate the different discourses in their arena of practice. The most significant aspect of critical thinking is raising a question which is the central aspects of both learning and knowledge creation. Therefore, the assessment of critical thinking would require an individual to be open for multiple solutions and have the motivation to examine the complex content deeply rather than just simply recalling facts or restating the answer.

Rationale

The attitude of prospective teacher educators towards critical thinking would help in bringing a desired social change in the formal Indian education system. It would also help them understand the need for collaborative planning and practice in their workspace which would help them grow as professionals. Facione (1990) defines critical thinking as "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as an explanation of the evidential, conceptual, methodological, or conceptual considerations upon which that judgment is based.

Different Policies and recommendations on the Indian education system highlight the need for improving quality in the education system. It is felt that the current practices in the education system fail to establish the relationship between the content taught in the classroom and its implication in the real world. Similar problems are being faced in the preparation of teacher educators where they end up spending more time "decorating their lesson-plan rather than reading and reflecting on what to teach, why and how" (Report of the High-Powered Commission on Teacher Education constituted by the Hon'ble Supreme Court of India, August 2012). Annual Status of Education Report (ASER), 2019 and National Achievement Survey (NAS), 2018 highlights the concerns related to quality in the Indian education system. This, in turn, raises the question regarding the quality of teacher education which "acts as a bridging agency between school education and society" (Sharma & Rawat 2014).

Critical thinking has a positive impact on the academic achievement of an individual that enhance their confidence level. Sherafat (2016) conducted a study to find out the effect of critical thinking on academic achievement among secondary and senior secondary students. The findings of the study suggest that higher the critical thinking levels, the better is the academic achievement scores. It means critical thinking positively affects the academic achievement of (secondary and senior secondary) students. The study also found that the age or the educational level does not pose an impact on critical thinking as secondary students were found performing better than the senior secondary students.

Different studies suggest different ways to enhance critical thinking. Patel (2010) found that the instructional strategies based on thinking tools and strategies were effective in enhancing fluency, flexibility and originality dimensions of creative and critical thinking among primary school teachers. Ojha (2018) conducted a study to develop the critical thinking skills of students in history through an inquiry-based approach in the classroom. The findings suggest that the inquiry approach was more effective than memorizing the facts in which students learned to appreciate the complexities, uncertainties, and ambiguities inherent in historical issues and problems.

Gopalakrishnan (2016) conducted an experimental study to see the effectiveness of the Educational Ergonomics Programme (EEP) in terms of critical thinking amongst students of XI grade. The findings suggest that critical thinking of the group who underwent the EFP program was enhanced at the end of the treatment. There are many studies conducted to see the impact of different interventions in enhancing the critical thinking of students studying at different levels of school education or higher education either in a subject or around the overall developmental domain. Also, some studies talk about the need for developing teaching competence and professionalism among teachers or teacher educators, but it is difficult to find the study that provides an example of the practice of enhancing critical thinking abilities among teacher educators.

There can be different factors that can affect the critical thinking of an individual. A research conducted on

"critical thinking tendencies and factors that affect critical thinking of higher education students" gives a result that shows that female student was seen to be better than male students on the dimensions of analyticity, open-mindedness, and truth-seeking. Whereas, inquisitiveness was the only dimension that male students were better than female students (Arselen, Gulveren, and Aydin (2014). Gender is defined as a "social construction of sexed bodies and an analytical tool for providing a conceptual bridge to past and present relationships between men and women" (Pearson and Rooke, 1993).

In India, from 1991 to 2014, female to male teacher ratio has increased from 41 to 88 in primary school and 44 to 90 in a secondary school as per the data of the Indian Human Resource Department. In urban areas, female teachers have outnumbered male teachers with many big schools having just 5 to 10% male teachers (Nair, 2017). But how far have they attained the sense of autonomy and decision-making is a question to inquire about. The percentage of female teachers is increasing rapidly compared to male teachers. Despite that, it would be difficult to say whether they can think critically in their profession that demands them to be reflective thinkers. Therefore, a comparative study of critical thinking based on gender became a chance to reflect on the process that one has gone through or going through to become teacher, educators.

Statement of the Problem

Our current Indian education system emphasized heavily on memorizing the answer to the question rather than testing the critical thinking skills, mentioned in almost all the reports based on the Indian education system. In India, around 77% of teachers are female and every year they are becoming part of this profession in a large number. Therefore, a study was conducted on, "Gender-Based Comparative Study of Critical Thinking Ability among Teacher Educators".

Significance of the Study

To ensure the quality of education system in India a good teacher educator is required for preparing a good teacher which would, in turn, be reflecting in the learning level of students. In the 21st century, it is important to have an education system that promotes critical thinking which would lead towards a maximum of innovation and creativity to excel in a worldwide scenario.

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Objective

The objective of the study was :

1. To study the influence of gender on critical thinking of male and female teacher educators.

Hypothesis

The Null-hypothesis (Ho) framed by the researcher:

1. There is no significant difference between the mean scores of critical thinking of male and female teacher educators.

Delimitations of the Study

The delimitations of the study were

1. The study was delimited to the English Medium universities only.
2. The study was conducted in the institutions of Gandhinagar city only.

Methodology

In the present study, the researcher used the survey method.

Sample

In the present study, a sample of 32 teacher educators was taken, out of which 16 were males and 16 were females. The sample consists of Teacher Educators, Research Scholars and Master of Education (M.Ed.) students among the age group of 21 to 50 years. The institutions selected for the purpose were English medium and the name of the institutions were Indian Institute of Teacher Education, Kadi Sarva Vishwavidyalaya and the Central University of Gujarat located in Gandhinagar city.

Sampling techniques

The sampling technique used by the researcher was purposive.

Tools

For the study, a self-developed test based on critical thinking ability was prepared by the researcher. The language of the test was English.

Data Analysis and Interpretation

The basic assumption of a parametric test, that is, the randomization of the sample was not fulfilled. Therefore, a nonparametric test that is, Mann Whitney 'U' test was used for data analysis purposes.

Table 1

Summary of Mann Whitney 'U' test for comparing Critical thinking of male and female

Critical Thinking	Gender	N	Mean Rank	Sum of Ranks	Z Value	Mann-Whitney 'U'	p-value	Re mark
	Male	16	18.09	289.80	0.964	102.50	0.335 **	S
	Female	16	14.91	238.50				

From table 1, it is clear that the value of Mann-Whitney 'U' is 102.50 for which the value of two-tailed significance is 0.335, which is greater than 0.05 level of significance, therefore 'U' value 102.50 and Z-value 0.964 is not significant at 0.05 level of significance. Hence, there is no significant difference between the scores of critical thinking of male and female teacher educators. In this view, the null hypothesis, "There is no significant difference between the mean scores of critical thinking of male and female teacher educators" is not rejected.

The data in table 1 clearly shows that the value of scores of critical thinking of males is 18.09 which is not significantly higher than the value of scores of critical thinking of female which is 14.91. Therefore, it can be concluded that the critical thinking of teacher educators is not influenced by gender. Some studies show a similar result. Salahshoor and Rafiee (2016) conducted a study to investigate the relationship between critical thinking and gender among Iranian (English as Foreign Language) learners. A result of a standardized test revealed that males and females were not significantly different from one another in applying critical thinking skills.

Leach (2011) in his study explored the five dimensions of critical thinking based on gender, college and academic discipline. The result of the study shows that there is no significant difference found among the gender aspect, however, students within a certain academic discipline is found to perform better in some areas of critical thinking. The study also indicated that the development of critical thinking is highly dependent on the environment and instruction by teachers. Another study regarding gender and problem solving administered under PISA (Programme for the International Student Assessment) by the Organisation for Economic Cooperation and Development (2009) found that gender differences in problem-solving for adolescents were few and insignificant.

The above studies suggest that the role of gender is not much in determining the critical thinking ability of an individual. However, the other factors that can play a major role in the critical thinking of an individual are the academic environment and teacher's facilitation at the school and university level. Afsahi and Afghari (2017) conducted a study with thirty students of Master of Arts (M.A.) to study the relationship between Mother Tongue, Age, Gender and Critical Thinking. The result of the study indicates that there is a significant relationship between mother tongue and critical thinking but there is no significant relationship between age, gender, and critical thinking level.

The reasons behind getting the above result were maybe because of the similar educational or academic attainment by both the male and female teacher educators. They have either completed or were pursuing a Master of Education (M.Ed.) degree, which means, they all were at a certain level of education. Therefore, there was no significant difference found in the relationship between critical thinking and the gender of the teacher educators.

Conclusion

The finding of the study showed that critical thinking is not affected by gender. The studies display the findings that it is not the gender that determines the critical thinking of an individual but the environment in which one is living. Another important point stated by almost all the study is the significance of critical thinking in one's academic or personal life as it demands self-reflection and self-regulation at every end of life. Similarly, the beliefs, practices, and attitude of teachers educators are significant to improve the educational scenario of the country as they are the ones who would prepare teachers to cope with their professional life challenges and provide a student-friendly environment which would, in turn, shape the motivation and achievement of students. Therefore, it can be concluded that there is no relationship between gender and critical thinking.

Implications of the study

The study can give direction for further researches which are going to explore or experiment towards improving the existing classroom practices of B.Ed and M.Ed. It can also be useful in designing a classroom pedagogy for student teachers. Also, it can guide teachers who are teaching at a different level of schools and colleges to stop generalizing the student's choice of subject with their gender.

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ATTITUDE TOWARDS E-LEARNING AMONG PROSPECTIVE ELEMENTARY AND SECONDARY TEACHERS

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ABSTRACT

Owing to the development of technology and the consequent usage of refined forms of technology in education, e-learning is emerging as an alternative model to education delivery. This is not just at higher education but at various levels of school education also. In the present milieu, most of the learners from a very young age are exposed to different kinds of information and communication technology tools, which imparts them a readiness to use them for education. All this demands that the teachers are aptly prepared with sound technological know-how and more importantly a favourable attitude towards e-learning. Through the present study, researchers attempted to ascertain the attitude of prospective teachers, of different levels, towards e-learning and difference among their attitudes. Analysis of the responses, on a 12 item Likert scale, from a sample of 100 each prospective elementary and secondary teachers revealed that secondary teachers had more favourable attitude than the elementary teachers towards e-learning.

Key words: *Attitude of ICT and E-learning.*

Introduction

Technology is playing a ubiquitous role in our lives, with every aspect of our life entangled with technology. Consequently, the educational processes and systems of today are increasingly facilitated, influenced and modelled to an extent by different forms of information and communication technology (Vaughan & Garrison, 2006). The role of technology is assuming different forms and has a rippling effect across the curriculum at all levels in educational institutions.

It is due to these increasing role and ever-changing nature of information and communication technologies, expectations about constant demand for incorporation of technology at different levels of education have been raised. This has resulted in the adoption of technology into the design and delivery of the curriculum at increasing levels. As mentioned earlier, the demand is not only at university or higher education level but also an inclination to adopt technology has been observed at school level which has changed the nature of curriculum implementation at the school level. This is a consequence of the changing socio-cultural dynamics at home as children from a very young age are exposed to different kinds of gadgets like mobile phones, electronic games etc. which are all ICT based resources. This has opened them to various non-traditional and unconventional avenues of learning even before they enter school or any form of formal learning centres. These changes induced by wholehearted adoption of different forms of information and communication technology by the system and learners has positioned academic staff in a situation wherein they are expected to move beyond just acquaintance with newer forms of learning and equipped well enough to use them effectively in the teaching-learning process in and outside the classrooms. Since the embracing of technology by the curriculum has been very quick, there are similar expectations from the teaching community to realize these significant changes within a very short and often unrealistic timeframe. Bates & Poole, 2003 (p. xiii) very aptly highlighted the challenges of teaching with technology, 'You cannot possibly keep up with the technology. The paradox of technology-enhanced education is that technology changes very rapidly and human beings change very slowly'. As an imperative consequence, teachers ought to be very quick at adapting to the changing

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demands very quickly so that they fit into the frame of their learners.

Doors of education and learning have been opened for people around the world to access education for free or for fewer costs by the 'web'. E-learning has emerged as a new paradigm to education by the different forms of technology. In simple words, e-learning is the acquisition and use of knowledge distributed and facilitated primarily by electronic means. This form of learning currently depends on networks and computers but will likely evolve into systems consisting of a variety of channels (e.g., wireless, satellite), and technologies (e.g., cellular phones, personal digital assistants) as they are developed and adopted. E-Learning is learning utilizing electronic technologies to access educational curriculum outside of a traditional classroom. A very comprehensive definition of e-learning is "E-Learning covers a wide set of applications and processes, such as Web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes delivering content via the Internet, intranet/extranet (LAN/WAN), audio and videotape, satellite broadcast, interactive TV, and CD-ROM" (ASTD, 2001). There is another popular definition of e-Learning by Allen (2003) which describes it as is a structured, purposeful use of the electronic system or computer in support of the learning process. It needs to be ascertained here that e-Learning is also known to offer the ability to share material in all kinds of formats such as videos, slideshows, word documents, and PDFs. It also comprises conducting webinars (live online classes) and offers the learners an option of communicating with professors via chat and message forums.

The importance or the need for e-Learning has been accepted worldwide and at different platforms and from different angles. Prime most, e-Learning is an affordable (and often free) solution which provides the learners with the ability to fit learning around their lifestyles, effectively allowing even the busiest person to further a career and gain new qualifications. Understandably it makes the learning process easier for people living in different time zones. It reduces the cost for both the providers of education and the receivers or beneficiaries of education. Since it is a newer medium it offers variety and breaks monotony for the learners.

Significance of the Study

Because of its dependence on technology, e-Learning will face resistance and take time to be adopted on a large scale. Amongst the different factors influencing the adoption of e-Learning, the attitude of teachers is a chief factor. Lumumba (2007) in his study on Kenya has taken a note on the challenges facing e-Learning in Public Secondary schools. He noted that the key obstacles to the e-learning project are – (i) lack of adequate e-Learning facilities (infrastructure), (ii) inadequacy of ICT skills among the teachers and learners, and (iii) a negative attitude towards e-Learning among students and teachers. There is no doubt to the fact that teachers' attitude is a major predictor of the acceptance and actual utilization of computers or any form of technology in the classrooms and the management of their work. Thus, the attitude of teachers towards e-learning is an important factor in shaping the success of e-learning in any kind of educational setting.

Under general circumstances, the pre-service teacher education courses are obligated to prepare teachers, especially at the school level. Once the teachers are in the school set-up, there are in-service programmes also; but their influence varies and is generally limited. Anyhow, it becomes imperative that both pre-service and in-service programmes are also geared and oriented towards the end of introducing teachers to different forms of ICT. Attitude development and shaping happen during the teaching-learning experiences the individual faces throughout the academic phase. Understandably, attitude towards e-learning is also shaped up by several factors including the training received exposure to different aspects, theoretical knowledge of different ICT resources, computer self-efficacy, internet self-efficacy, computer experience, internet experience, and computer anxiety among other factors. Their computer experience including perceived self-efficacy, enjoyment, and usefulness of using e-learning also plays a role (Liaw & Huang, 2011). Amongst the different stages of academic life, the influence of pre-service training is paramount on the teachers because the pre-service teacher education course orients them towards teaching. The training they receive, and also the experiences they gain – both influence the kind of attitude prospective teachers to develop. These prospective teachers would enact and

implement the e-learning in the classrooms. Thus, it becomes vital to ascertain the attitude of teacher education students (of different levels) towards e-learning. It needs to be acknowledged here that a similar study on "Attitude towards e-Learning: A Study of In-service Teachers and Teacher Education Students" was done in 2016 (Joshi, D. & Chabra, S.) but was done on a different population. One of the researchers of the present study was a part of that study also and so there could be similarities in the design and presentation of results.

Review of Related Literature

Bhuvaneswari and Padmanaban (2012) studied attitude of senior secondary students towards e-learning and reported that various socio-demographic factors do affect the attitude of students towards the e-learning like gender, subject specialization, parents' education, parents' monthly income and school management. Similar kind of study was done by the Gupta and Sharma (2018) where the type of school management and gender did play a role in attitude formation towards e-learning whereas locale (rural and urban) and streams did not play a significant role in attitude formation. Behera, Sao & Mohamed (2016) did a similar study on B.Ed students and found out that gender, locale, pre-service and in-service, category of students, stream of students and type of management did not plays a role in attitude formation of teachers towards e-learning. A study was conducted by Zabadi & Al-Alwai (2016) on attitude towards e-learning and reported that high standard on attitude towards e-learning and their attitude results significantly vary with their gender, technology usage and skills. Hussain, Hashmi, Abid and Zahid (2018) studied the prospective teachers' attitude towards e-learning in Pakistan and reported that gender did not play a significant role in attitude formation. Thus, few studies indicated an inconclusive role of socio-demographic factors on attitude towards e-learning.

Objectives

The objectives of the present study were -

1. To study the attitude of prospective elementary teachers towards e-learning.
2. To study the attitude of prospective secondary teachers towards e-learning.
3. To study the difference in the attitude of prospective elementary and secondary teachers towards e-learning.

Hypotheses

There is no significant difference in the attitude among prospective elementary and secondary teachers.

Study Design

It is cross-sectional survey research wherein irrespective of the institutional, social, economic and other background factors, pupil-teachers were part of the sample. A multistage sampling technique was adopted to select a sample of students. Teacher education institutions offering both the elementary and secondary teacher education programme were selected for the present study. In total ten teacher education institutions 5 each from Faridabad and Gurugram districts was selected. From each of the institutions total 20 students were randomly selected; 10 elementary and 10 of the secondary teacher education programme. Thus, a total of two hundred prospective teachers, 100 each of elementary and secondary level were selected for research purpose.

The tool used: Santosh Panda and Sanjay Mishra had developed a scale on measuring the attitude of towards e-learning which was quite apt for the present investigation. Scale comprised 12 items which helped in measuring attitudes of pupil-teachers towards e-learning. The scale had five-point agreement /disagreement scale given with the numerical values assigned to each point- 5= strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, and 1 =strongly disagree.

Data Analysis : Ms-Excel was used to analyze the data collected from the research. Statistical treatments used for the present research were frequencies, percentages, and t-test to measure the significant difference among the two groups.

Major Findings

The results obtained from the analysis of the responses on different items have been clubbed under following headings for better comprehensibility of the readers

Table 1
(i) Demographic details of the sample – The demographic details of the sample has been encapsulated in the following table - 1

S. No.	Demographic factors	Elementary pupil-teachers		Secondary pupil-teachers	
1	Gender	Male	Female	Male	Female
		20	80	24	76
2	Average Age	19.56		25.96	

The teacher education students pursuing elementary course were 100 in number – including 20 males and 80 females. The average age of prospective elementary teachers' was 19.56 years. The sample of 100 prospective secondary teachers comprised of 76 females and 24 males. The average age of prospective elementary teachers was 25.96 years.

(ii) The attitude of prospective elementary teachers towards e-learning – There has been a general agreement that the attitude of teachers towards a particular method or technique or pedagogy of teaching is significantly correlated with teaching success. Their role is vital in the implementation of any pedagogic innovation or any form of practice in teaching-learning conditions. The attitude of prospective elementary teachers was 4.06 which is an indicator of a favourable attitude towards e-learning. Details about the variation in the attitude of this group of prospective teachers towards e-learning are given in the following table –

Table 2
The attitude of prospective elementary teachers towards e-learning

Range of Average Score	No. of prospective elementary teachers	Interpretation
>4.5	20	Extremely favourable
3.6 – 4.5	76	Favourable
2.6 – 3.5	4	Neutral
>2.6		-

It is very clear from the above table No.2 as well as figure No.1, that majority (76%) had favourable attitude towards e-learning, 20% had extremely favourable and only 4% had a neutral attitude towards e-learning. The numbers are an indicator that the prospective elementary teachers are optimistic about the use of e-learning. One of the items needs to be mentioned here which gained maximum score gained from all the respondents. The statement read "e-Learning will bring new opportunities for organizing teaching and learning". A high score on the above item indicates that the prospective elementary teachers are confident about the new opportunities which e-learning can offer. This is a group which is pretty familiar with the school system because they have regular interaction with the school system. Some of them would have gone through the school experience programme also. This strengthens the belief that adoption of e-learning at primary school education level can garner attention from the students and teachers alike.

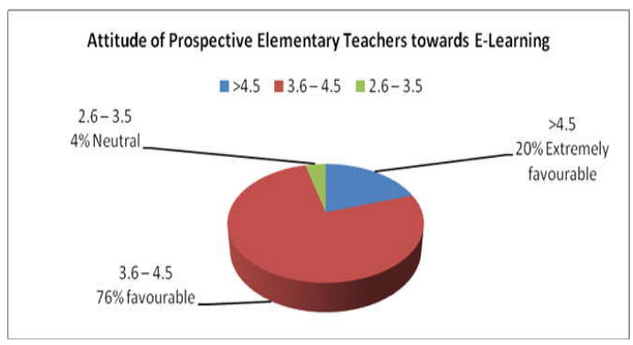

Figure 1 : Graphical representation of the attitude of prospective elementary teachers' towards e-learning

(iii) The attitude of prospective secondary teachers towards e-learning – No words can appropriately express the number of effective teachers has on the whole education system, especially the teaching-learning process in the classroom. Their attitude thus becomes an important factor in foreseeing the success of any new pedagogic intervention at the school education level. The average attitude of prospective secondary teachers was 4.46 which is an indicator of an extremely favourable attitude towards e-learning. Details about the variation in the attitude of prospective secondary teachers towards e-learning have been encapsulated in the following table –

Table 3
The attitude of prospective secondary teachers towards e-learning

Range of Average Score	No. of prospective secondary teachers	Interpretation
>4.5	18	Extremely favourable
3.6 – 4.5	78	Favourable
2.6 – 3.5	4	Neutral
>2.6	0	-

Data clubbed in the above table No. 3 and represented in graphical figure 2 makes it obvious that the prospective secondary teachers held a favourable attitude towards e-learning. 78% of these prospective teachers had a favourable average attitude of 4.46 which is an indicator of the aspirations and hopes of teacher education students from e-learning. Another 18% also had an extremely favourable attitude towards e-learning and only 4% held a neutral attitude towards e-learning. This is a sign of hope about the success of e-learning if adopted at secondary and senior secondary level in school education.

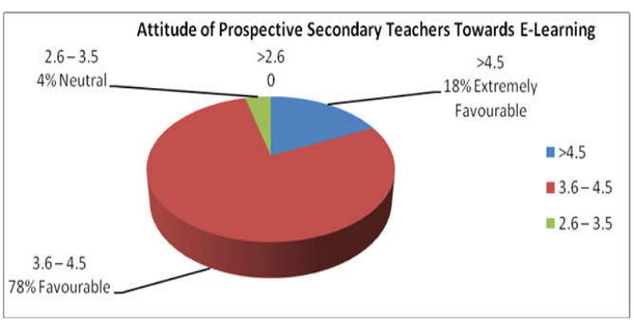

Figure 2 : Graphical representation of the attitude of prospective secondary teachers' towards e-learning

(iv) The difference in attitude among prospective elementary and secondary school teachers towards e-learning –The third objective of the study was to analyze the difference in their attitude towards e-learning among the two groups of prospective teachers. The following table summarizes the same-

Table 4
The difference in attitude among prospective elementary and secondary teachers

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Group	N	Mean score	S.D	Calculated 't'-value	Re marks
Prospective elementary teachers	100	36.50	6.83	3.093*	S
Prospective secondary teachers	100	39.40	6.4		

*Significance at alpha .01 level

The above table No 4 clearly shows the difference in the mean scores of the two groups is significant. As the mean score of secondary teachers is high, therefore secondary teachers had a more favourable attitude towards e-learning than the elementary teachers. The probable reason being is that prospective secondary teacher is having more exposure to e-learning as it is reflected in the average age as well as because of the higher educational qualification. Thus, it can be easily concluded that the difference in attitude towards e-learning among the prospective elementary and secondary teachers was found to be significant.

Conclusion

Educationists and teachers believe that the audio-visual method of teaching creates a learning environment which fosters effective student engagement in the class. Besides other benefits, e-learning can prove to be a revolution in learning genre. It can give the avenue for teachers a higher degree of coverage to deliver the content regularly, which ensures consistency. Since it bridges the distance across the demography and geography, e-learning has become a more suitable environment for many students at different levels of education. However, as for any other pedagogical intervention, the success of e-learning would largely rest on a favourable attitude prevalent both among the users, i.e. the learners, and the implementers, i.e. the teachers. The results of the present study are promising as both prospective elementary and secondary teachers hold

a favourable attitude towards e-learning. The implication of the research would be for the planners and providers of the resources in the school to provide an environment conducive to e-learning.

Educational Implications

ICT has been an integral part of the teaching-learning process and current teachers must be digitally native rather than immigrants. ICT has become a part and parcel of the teacher education curriculum. But what needs to be done is that in the web world there is plenty of ICT based subject-specific pedagogical tools are available and also there videos available wherein one through self-directed learning can learn how to integrate these tools in teacher pedagogy. Teacher-educators must mentor their prospective teachers to use a maximum of these free of cost available software's and tools in their internship programmes as well as during teaching-learning activities like assignment preparation and submission, seminar presentation, during the evaluation process, etc so that prospective teachers become user friendly on using these ICT tools and software and use them when they become regular teachers.

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SELF-EFFICACY OF SECONDARY TEACHER EDUCATION STUDENTS

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ABSTRACT

The main objective of the study was to find out the significant difference if any, in self-efficacy of Secondary Teacher Education Students with respect to background Variables. The investigator adopted the survey method to carry out the research. The Sample consists of 100 Secondary Teacher Education Students who were selected through the stratified random sampling technique. The findings revealed that there was no significant difference in the self-efficacy of Secondary Teacher Education Students based on Gender, Educational Qualification, Locality, Income Group, Medium of instructions and Disciplines and significant difference in the self-efficacy of Secondary Teacher Education Students based on marital status.

Key words: *self efficacy, teacher education*

Introduction

The important Characteristic of a prospective and efficient teacher is self-Efficacy which enables him/her to become a successful teacher to meet the challenges in education and to achieve the goals and aims of teaching and to effectively help the student community. Self –efficacy should be acquired and possessed permanently even from the stage of being a secondary teacher education students. Self-efficacy is an absolute necessity and no lucid explanation of it is appropriate at this function. Self-efficacy is defined as "Peoples' judgments of their capabilities to organize and execute the course of action required to attain designated types of performance. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses" (Bandura, 1986). Bandura also affirmed that self-efficacy beliefs develop in response to four sources of information. These are enactive experience, vicarious experience, verbal persuasion and physiological and affective states. Enactive experience implies that success in the performance of a given task will increase the self-efficacy of the person who has successfully performed the task. The enactive vicarious experience involves "where other people are seen to succeed or fail and how that can affect one's self-efficacy". A strong sense of efficacy enhances human accomplishment and personal well-being in many ways. People with high assurance in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an efficacious outlook fosters intrinsic interest and deep engrossment in activities. They set themselves challenging goals and maintain a strong commitment to them.

Significance of the study

The national policy of education (1968) stated, "Of all factors which determine the quality of education and its contribution to national development, the teacher is undoubtedly the most important. It is on his personal qualities and character, his educational qualifications and professional competence that the success of all educational endeavour must ultimately depend."

In the era of knowledge explosion where the world is characterized as a global village, the modern concept of teaching has become child-centred. It covers learning and interaction of students with a teacher. Thus the teacher of the nation has to shoulder new responsibilities which extend far beyond the boundary of the classroom. Teachers especially at the secondary level have to deal with the growing generation of the society and are confronted with many physical, mental, emotional and social problems. That's why it is almost mandatory for teachers to be competent enough to deal with these problems.

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If the teacher is competent in his profession and has the above qualities then such adverse conditions will not arise. The teacher is a role model for his student and he plays a vital role in the behaviour modification of students. The competent teacher must attract the students to class

Objectives of the study

1. To find out whether there is any significant difference between male and female secondary teacher education students in their Self-efficacy
2. To find out whether there is any significant difference between Under Graduate and Post Graduate secondary teacher education students in their Self-efficacy
3. To find out whether there is any significant difference between Rural and Urban secondary teacher education students in their Self-efficacy
4. To find out whether there is any significant difference between High-Level Income Group, Middle-Level Income Group and Low-Level Income Group secondary teacher education students in their Self-efficacy
5. To find out whether there is any significant difference between Married and Unmarried secondary teacher education students in their Self-efficacy
6. To find out whether there is any significant difference between Tamil Medium and English Medium secondary teacher education students in their Self-efficacy
7. To find out whether there is any significant difference between Arts and Science secondary teacher education students in their Self-efficacy

Hypotheses of the study

1. There is no significant difference between male and female secondary teacher education students in their Self-efficacy
2. There is no significant difference between Under Graduate and Post Graduate secondary teacher education students in their Self-efficacy
3. There is no significant difference between Rural and Urban secondary teacher education students in their Self-efficacy
4. There is no significant difference between High-Level Income Group, Middle-Level Income Group and Low-Level Income Group secondary teacher education students in their Self-efficacy
5. There is no significant difference between Married and Unmarried secondary teacher education students in their Self-efficacy
6. There is no significant difference between Tamil Medium and English Medium secondary teacher education students in their Self-efficacy
7. There is no significant difference between Arts and Science secondary teacher education students in their Self-efficacy

The method used

The investigator has adapted the survey method of research to find out the level of Self-efficacy of secondary teacher education students.

Tools used

The Self Efficacy Scale developed and validated by Padma and Jeyanthi was used in the study.

Population

The population of the study consisted of Secondary Teacher Education Students from the College of Education in Ramanathapuram District, Tamilnadu

Sample

The investigator used the stratified random sampling technique for selecting the sample from the population. The sample consisted of 100 Secondary Teacher Education Students from two B.Ed., Colleges.

Statistical Techniques Used

Statistical techniques used in the study are Arithmetic Mean, Standard Deviation (SD), and t'-Test.

Hypothesis 1: There is no significant difference between male and female secondary teacher education students in their Self-efficacy

Table1

Difference between male and female secondary teacher education students in their self-efficacy

Dimension	Group	N	Mean	S.D	Calculated 't' value	Remark
Self-Efficacy	Male	9	95	13.00	0.45	NS
	Female	91	99.7	7.90		

(At 5%level of significance the table value based on 't' is 1.96)

It is inferred from the above table there is no significant difference between male and female secondary teacher education students in their Self-efficacy. Hence the null hypothesis is accepted.

Hypothesis 2: There is no significant difference between Under Graduate and Post Graduate secondary teacher education students in their Self-efficacy

Table 2

Difference between undergraduate and postgraduate secondary teacher education students in their self-efficacy

Dimension	Graduate	N	Mean	S.D	Calculated 't' value	Remark at 5% level
Self-Efficacy	Under Graduate	80	99	8.5	0.61	NS
	Post Graduate	20	100	5.9		

(At 5%level of significance the table value of 't' is 1.96)

It is inferred from the above table there is no significant difference between Under Graduate and Post Graduate secondary teacher education students in their Self-efficacy. Hence the null hypothesis is accepted.

Hypothesis 3: There is no significant difference between Rural and Urban secondary teacher education students in their Self-efficacy

Table 3

Difference between rural and urban secondary teacher education students in their self-efficacy

Dimension	Locality	N	Mean	S.D	Calculated 't' value	Remark at 5% level
Self-Efficacy	Rural	60	99	8.6	0.61	NS
	Urban	40	99.5	8.6		

(At 5%level of significance the table value of 't' is 1.96)

It is inferred from the above table there is no significant difference between rural and urban secondary teacher education students in their Self-efficacy. Hence the null hypothesis is accepted.

Hypothesis 4: There is no significant difference between Low-Level and medium Level Income Group, medium-Level and high level income group and low and high level income group of secondary teacher education students in their Self-efficacy

Table 4

Difference between High, Middle and Low-level Income group of secondary teacher education students in their self-efficacy

Dimension	Income Group	N	Mean	S.D	Calculated 't' value	Remark at 5% level
Self-Efficacy	Low-level Income	22	100	7.81	7.81	NS
	Medium level Income Group	41	98.41	7.51		
Dimension	**Income Group**	**N**	**Mean**	**S.D**	**Calculated 't' value**	**Remark at 5% level**
Self-Efficacy	Medium level Income Group	41	98.41	7.51	0.71	NS
	High-level Income Group	37	99.86	10.02		
Dimension	**Income Group**	**N**	**Mean**	**S.D**	**Calculated 't' value**	**Remark at 5% level**
Self-Efficacy	Low-level Income Group	22	100	7.81	0.78	NS
	High-level Income Group	37	99.86	10.02		

(At 5%level of significance Middle-Level the table value of 't' is 1.96)

It is inferred from the above table there is no significant difference between High-Level Income Group, Middle Level Income Group and Low-Level Income Group secondary teacher education students in their Self-efficacy. Hence the null hypothesis is accepted.

Hypothesis 5: There is no significant difference between married and unmarried secondary teacher education students in their Self-efficacy

Table 5

Difference between married and unmarried secondary teacher education students in their self-efficacy

Dimension	Marital Status	N	Mean	S.D	Calculated 't' value	Remark at 5% level
Self-Efficacy	Married	23	102.82	5.09		
	Unmarried	77	98.25	9.19	3.06	S

(At 5%level of significance the table value of 't' is 1.96)

It is inferred from the above table there is a significant difference between Married and Unmarried secondary teacher education students in their Self-efficacy. Hence the null hypothesis is rejected.

Hypothesis 6: There is no significant difference between Tamil Medium and English Medium secondary teacher education students in their Self-efficacy.

Table 6

Difference between Tamil Medium and English Medium secondary teacher education students in their Self-efficacy.

Dimension	Medium of Instructions	N	Mean	S.D	Calculated 't' value	Remark at 5% level
Self-Efficacy	Tamil	90	95	11.83	1.217	NS
	English	10	99.67	8.07		

(At 5%level of significance the table value of 't' is 1.96)

It is inferred from the above table there is no significant difference between Tamil Medium and English Medium secondary teacher education students in their Self-efficacy. Hence the null hypothesis is accepted.

Hypothesis 7: There is no significant difference between Arts and Science secondary teacher education students in their Self-efficacy.

Table 7

Difference between Arts and Science secondary teacher education students in their Self-efficacy

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Dimension	Disciplines	N	Mean	S.D	Calculated 't' value	Remark at 5% level
Self-Efficacy	Arts	42	100	6.98	0.84	NS
	Science	58	98.62	9.41		

(At 5%level of significance the table value of 't' is 1.96)

It is inferred from the above table there is no significant difference between Arts and Science secondary teacher education students in their Self-efficacy. Hence the null hypothesis is accepted.

Hypothesis 8: There is no significant difference between First Graduate and not First Graduate secondary teacher education students in their Self-efficacy

Table 8

Difference between First Graduate and not First Graduate secondary teacher education students in their Self-efficacy

Dimension	First Graduate	N	Mean	S.D	Calculated 't' value	Remark at 5% level
Self-Efficacy	First Graduate Students	53	99.34	9	0.29	NS
	Not a First Graduate Students	47	98.83	8.39		

(At 5%level of significance the table value of 't' is 1.96)

It is inferred from the above table there is no significant difference between First Graduate and not First Graduate secondary teacher education students in their Self-efficacy. Hence the null hypothesis is accepted.

Hypothesis 9: There is no significant difference between students whose parents are teachers and not teachers of secondary teacher education students in their Self-efficacy.

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MASTERY LEARNING STRATEGY AND SCIENCE ACHIEVEMENT: AN EXPERIMENTAL STUDY

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ABSTRACT

Mastery Learning strategy is based on the philosophy that content, with any level of complexity, can be mastered by all learners if taught at their level of convenience. Researches, in this area, indicated a strong relationship between instruction based on Mastery Learning strategy and students' achievement in science. This experimental study was conducted on class VIII students to explore the effects of mastery learning strategy on their achievement of science. The results indicated a clear and positive impact of mastery learning strategy on science achievement of learners. Quite contrary to popular gender-biased stereotyped, girls of the study performed better than boys in science.

Keywords: *Mastery Learning Strategy, Science Achievement*

Introduction

Education has been considered as the most powerful instrument of social, economic and political change as well as for the development of an individual. No other investment is greater than education as it is the most important input for national development. Education plays an essential role in the nation's socio-economic development based on evidence, towards strengthening of the truly democratic and egalitarian society, promoting the national unity and integration, and most of all for the individual transformation in the endless quest of knowledge, perfection and excellence. Education is the most powerful tool based on science and technology in the process of modernization. It is to be noted that the science syllabus is not directed to the "production of scientists" in the schools. Science education aims to give necessary knowledge, skills and appreciation of scientific phenomenon which may produce the "non-scientists" for overall life. Science teaching at elementary and secondary stage should instigate the student into the use and appreciation of the scientific methods and science process skills by which facts are discovered, relationships are established, and conclusions are drawn. Most of the time teachers in classroom focus on average learners and also plan and design their lessons accordingly and thereby tend to neglect the below andabove-average students. Due to less attention of teachers, the above-average students feel bored and below-average remain passive and gradually become weak in the subject matter. Mastery learning technique, here, is an answer, as it caters to the need of all learners.

Globally, education has, for several centuries, emphasized the need for the holistic development of every individual. It is also considered a primary function of education. Schools and teachers should, therefore, focus on curriculum and instructional strategies to nurture some essential qualities among learners, which will allow them to live in society efficiently. A primary educational objective is to assist learners in becoming an efficient problem solver i.e. individuals who can create constructive and unique solutions if they are confronted with unprecedented problems. Education, therefore, implicitly includes the ability to solve problems. Education is the training of the mind to think and every child has to deal with the daily problems. The prime responsibility of every teacher lies in his/her capacity to make all learners 'master' the taught content and topic with a high level of understanding. This earnest need prompts a quest for the teaching strategy that could transform nearly all students into effective problem solvers.

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The teaching strategy that provides rewarding and successful learning experiences to nearly all learners is Mastery Learning. In mastery learning strategy all learners can master the content that they have studied in their class. Mastery learning is a cyclic process in which learning and evaluation go on until the "mastery" is achieved by all students. It is based on the fact that all learners can learn when they are given adequate support and appropriate activities. Here, in this study, an attempt has been made to uncover the impact that mastery learning strategy has on the achievement of the learner in science.

Review of Related Literature

The trace of a mastery learning strategy can be attributed to the behaviouristic principles of learning that focuses on the connection between stimulus and response for learning to occur. According to Baum (2005), "Mastery learning, in line with the behaviour theory, focuses on noticeable behaviours that can be observed and measured". In this strategy, the material or topics are broken down into smaller subparts and arranged consecutively and in hierarchical sequence. Before moving to the next topic, learners must be able to express the taught concepts to show mastery over the topic. Researches found a strong connection between Mastery Learning Strategies and students' achievement in science. Guskey& Gates (1986), Ezinwanyi (2013), Sood (2013), Kaur & Singh (2015), Hussain & Suleman (2016), Filgona, Filgona&Sababa (2017), Iserameiya, Ejodamen &Agbonghale (2018) and Yemi (2018) reported increased achievement level of students who were taught by mastery learning model. The studies conducted by Dillashaw and Okey (1983), Bala (1997), Wambugu and Changeiywo (2008), Achufusi and Mgbemena (2012), Agboghoroma (2014), Adeyemo and Babajide (2014), Sarita and Jyoti (2014) and Udo and Udofia (2014) reported that students tutored through mastery learning strategy show higher level of achievement in science subject.

Besides, Olson'ss (1988) study indicated that mastery learning had a considerable impact on the gender of learners. John, Barchok & Ng'eno (2014) reported that there was no significant difference between male and female motivation level taught through mastery learning approach. Researches of Alam (2017) and Kaur (2017) disclosed that there were no considerable differences in science achievement of female and male students. Banerjee (2016) also reported similar results. On contrary to these studies, Rajendran (2007), Achufusi and Mgbemena (2012), Dalvi (2017), Iserameiya, EjodamenandAgbonghale (2018)found in their studies that female students achieved considerably better than male students, taught using mastery learning strategy.

Another study of Singh (2014), Udo and Udofia (2014) reported that performance of male students in science tutored through mastery learning strategy was better than female students. An exhaustive literature review revealed that there is a paucity of studies concerning mastery learning strategy and science achievement, especially in Indian settings. No study was reviewed by the researcher in the state of Bihar concerning mastery learning strategy and science achievement. Thus, the researchers felt the need to study the outcome of a mastery learning model on the science achievement of students of class VIII from Patna, Bihar.

Research Questions

In connection with mastery learning strategy, some of the questions that spontaneously occurred in the mind of the researchers are:

1. Does Mastery Learning Strategy have any impact on Science Achievement?
2. Whether students taught science through mastery learning strategy have more conceptual understanding of science as compared to the student taught through the traditional method of teaching?

Only scientific and systematic research will provide reliable answers to these types of questions. The present study made a humble effort in this direction.

Objectives

The present study was intended to achieve the following objectives:

1. To study the effect of Mastery Learning Strategy on the science achievement of class VIII students.
2. To compare the science achievement of class VIII Boys and Girls students taught through Mastery Learning Strategy

Hypotheses

To achieve the objectives of the present study, the following null hypothesis has been stated:

1. Mastery learning strategy does not affect the science achievement of class VIII students.
2. There is no significant difference between the science achievement of Boys and Girls student of class VIII taught through Mastery Learning Strategy.

Research Method and Design

The experimental research method was found to be the most appropriate in adequately achieving the objectives of the present study and, therefore, was applied. In the present study, a single group pre-test post-test design was used.

Participants

The target population for the present study was the class VIII students, studying in government schools of Patna City of Bihar state. As per the information obtained from the District Education department, Patna, there are 81 middle schools in Patna District.

In this study, a multi-stage random sampling technique was employed. Multi-stage sampling is a probability sampling method where the sampling takes place in several stages to reduce the sample size at each stage. At Stage I, researchers selected randomly one block from the total four blocks in the Patna City. The selected block was Malsalami Block. In Stage II, one school was selected randomly from all schools, situated in Malsalami Block. The selected school was Govt. Middle School, Begumpur. After this, all students of class VIII of Govt. Middle School, Begumpur, Malsalami were considered as a sample of the study. Total no. of participants in the present study was (N=31, 16 Boys and 15 Girls).

Tools Used

To attain the objective of the present study, the following two tools were constructed and standardised by the researchers: –

1. Science Achievement test (SAT)
2. Lesson Plan based on Mastery Learning Approach (LP-MLA)

Data Analysis

The present study aimed at studying the impact of Mastery Learning Strategy on the science achievement of class VIII students and to compare the science achievement of class VIII boys and girls taught through Mastery Learning Strategy. In light of this, the appropriate statistical technique, t-test, was used in the present study.

The procedure of Data Collection

The researchers visited Government Middle School, Begumpur, Patna city, Bihar for obtaining data from class VIII students. For this, written permission was taken from the school Principal. The data were collected during the period of 24 December 2018 to 12 January 2019. First of all, rapport was established with the class VIII students. Then the Pre-test was administered to students. Proper instructions were given to students in verbal form. The student was asked to go through the question paper properly and answer all the questions. When students filled the question booklets, it was collected from them. After that, the researchers delivered 15 lessons to class VIII students on Science subject throughout the data collection period. Researchers delivered lessons by following the lesson plan based on Mastery Learning Strategy following a constructivist paradigm. All the lessons were interactive and delivered with the help of Smart classroom. All the students were actively involved during the teaching-learning process. After delivering the entire lessons, the researchers administered the post-test by the following pre-test. Instructions were also given in the verbal form. In the end, the researcher thanked students for their cooperation and active involvement during the teaching-learning process.

Results

Objective 1 : To study the effect of Mastery Learning Strategy on the science achievement of class VIII students.

Hypothesis 1 : Mastery learning strategy does not affect the science achievement of class VIII students.

Table 1

Showing difference in the science achievement of students taught through a mastery learning strategy

Groups	Mean	SD	Df	*SED*	Calcu lated 't'-value	Critical Value	Re mark
Pre-test	12	2.42	29	0.678	17.51	2.04	S
Post-test	23.87	4.32					

A significant difference was found between the science achievement of students taught through mastery learning strategy. The critical value for the degree of freedom is 2.04 at .05% level of significance and the calculated t-value is 17.51 which exceeds a critical value ($p<0.05$). Therefore, it can be taken as significant which means that Mastery learning strategy has a significant effect on the science achievement of students. This finding is well supported by previous studies of Dillashaw& Okey, 1983; Bala, 1997; Wambugu and Changeiywo, 2008; Achufusi and Mgbemena, 2012; Agboghoroma, 2014; Adeyemo and Babajide, 2014; Sarita and Jyoti, 2014; Udo and Udofia, 2014; Hutcheson, 2015; Mitee and Obaitan, 2015.

Discussion

These results are also consistent with those of several earlier studies in which Mastery Learning Strategy enhanced the understanding of basic concepts in science education among students. Mastery Learning Strategy is as effective as it insists on achieving one unit's mastery before moving to the next unit. Therefore, before studying the topic, the prerequisite for the next topic is well mastered. The students, exposed to Mastery Learning Strategy, acquired the concept of science significantly better than the students exposed to conventional methods.

Objective 2 To compare the science achievement of class VIII Boys and Girls students taught through Mastery Learning Strategy

Hypothesis 2. There is no significant difference between the science achievement of Boys and Girls student of class VIII taught through Mastery Learning Strategy.

Table 2

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Showing difference in the science achievement of Boys and Girls students taught through a mastery learning strategy

Groups	Mean	SD	Df	*SED*	Calcu lated 't'-value	Critical Value	Re mark
Girls	26	2.85	14	1.626	2.62	2.14	S
Boys	21.73	4.56					

Table 2 shows the mean achievement values of girls and boys as 26 and 21.73 respectively. The meaningful value of t-ratio is 2.6247 ($p<0.05$) which exceeds the critical value and hence null hypothesis stands rejected. It can be concluded that Boys and girls differ in their science achievement. In the present study, girls achieve higher than boys in science. This finding is well supported by previous studies of Olson (1988), Rajendran, (2007), Achufusi and Mgbemena (2012), Udo and Udofia (2014), Dalvi (2017), Mayanchi, Anya &Kainuwa (2017), Iserameiya, Ejodamen&Agbonghale (2018).

Discussion

These results are also consistent with those of several earlier studies that demonstrate the significant gender-based difference in science achievement of students taught through Mastery Learning Strategy. There are studies which supported the finding that Mastery Learning strategy has significant on Science achievement of students (both boys and girls). In the present study girls' achievement are higher as compared to boys' achievement in science. The girl students exposed to Mastery Learning Strategy, thus, acquired the concept of science significantly better than those of boys' students.

Educational Implications

As far as the applicability and usefulness of the study is concerned, the following are the thrust areas, where the study can be helpful: -

For teachers: Teachers with their teaching strategies not only affect what and how their students learn but also shape their students' attitude towards learning. Mastery Learning Strategy offers teachers a way to make the best and most positive change in learners. It gives teachers a

powerful instrument that will increase their effectiveness in helping a large number of students to learn well and gain many positive benefits, such as motivation and improved self-concept in their learning. The findings have important implications for improving learning in science. Science teachers should use Mastery Learning Strategy for enhancing the performance of students. Through Mastery Learning Strategy, students get adequate time to master the content. It will also help Science teachers to classify students in various groups having different achievement levels and teach them accordingly to raise their achievement level.

For students: This strategy helps in increasing the thinking ability of students. Feedback practices in Mastery learning strategy would help students minimize their learning difficulties. Mastery Learning Strategy involves greater learner participation and also increases teachers' interaction with students. Mastery Learning Strategy helps students of different socio-economic backgrounds; all learn excellently and succeed in school.

For curriculum planners: Curriculum planners will find this study useful in designing appropriate teaching strategies that include the Mastery Learning Strategy to enhance science achievement.

For parents: This study is beneficial for those parents who send their children to the coaching classes. This study helps parents in understanding that students can learn as well as master the concept in school if every science teacher adopts this strategy.

For society and nation: This study is helpful for society as mastery learning strategy increases the science achievement of students and thus, contributes towards the development of society as well as the nation. It cannot be denied that science education is very important for the development of any nation.

Delimitations of the Study

This study had the following delimitations:

1. The present study was confined to Government Middle Schools of Patna City.
2. In the present study, the sample was drawn only from VIII class students.
3. The present study was confined to science subject only.
4. The experimental treatment for the 2018-19 academic sessions was delimited to 15 working days.

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Conclusion

Single group pre-test and post-test designs were used to test the effect of Mastery Learning Strategy on students' science achievement. The finding, the science achievement of the pre-test indicated a significant difference compared to the post-test. More studies are needed for further research using similar samples or larger samples. It is expected that more significant findings will contribute to this. The researchers conclude that Mastery Learning Strategy is an effective teaching strategy that should be encouraged to be used and adopted by all school teachers. Mastery Learning Strategy can be implemented to enhance student achievement.

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SELF-EFFICACY OF SECONDARY...

Table 9

Difference between students whose parents are teachers and not teachers of secondary teacher education students in their Self-efficacy

Dimension	Parental Status	N	Mean	S.D	Calculated 't' value	Remark at 5% level
Self-Efficacy	Parents are Teacher	22	99.75	7.9	0.86	NS
	Parents are not Teacher	78	97.72	10.29		

(At 5%level of significance the table value of 't' is 1.96)

It is inferred from the above table there is no significant difference between whose parents are teachers and not teachers of secondary teacher education students in their Self-efficacy. Hence the null hypothesis is accepted.

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Findings

Self-efficacy of secondary teacher education students does not differ significantly based on Gender, Educational Qualification, Locality, Income Group, Medium of instructions and Disciplines. Self-efficacy of secondary teacher education students differ significantly on the basis of Marital Status. The secondary teacher education students who are unmarried have a higher level of self-efficacy than the students who are married. The level of Self-Efficacy of secondary teacher education students is high.

Teachers' self-efficacy beliefs have been repeatedly associated with positive teaching behaviours and student outcomes. However, teacher efficacy has developed a storied history regarding construct validity and measurement integrity. Study of teacher efficacy now stands on the verge of maturity, but such developmental growth will likely be contingent on the development of strong theoretical models and effective instrumentation to assess theoretical constructs.

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PSYCHOMETRIC PROPERTIES OF PARENTAL AND PEER INFLUENCE SCALE AND ITS RELATIONSHIP WITH ACADEMIC PERFORMANCE OF STUDENTS

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ABSTRACT

This study attempts to develop psychometric characteristics of parental and peer influence scale and its association with the academic performance of undergraduate students. In this connection, a highly valid scale development procedure has adapted to examine psychometric properties of parental and peer influence scale. Scale development approach results confirmed structural, convergent and construct validity of all subscales of parental and peer influence. In addition, the correlational study explored the significant and positive relationship of parental and peer influence with academic performance of students. Consequently, researchers could integrate these two measures into a combined scale, to simplify statistical analysis.

Keywords: *Parental Influence, Peer Influence, Factor Analysis, Academic Performance.*

Introduction

A great deal of educational research and practice has shown that parental and peer influence play an imperative role in human development. Primary school experiences offer the construct for future behaviour in both social and academic settings. The amount to which peer-influence affect decision-making, motivation, goal setting, and overall academic performance, is widely debated and subject to mixed results (Reich, 2012). Academic motivation of students and performance is also affected by parental influence in context with academic goals and socialization. The social context plays a key role in determining psychological development and behaviour (Wise & King, 2008). Perhaps, the family is the most important social agency (Bray, Harvey,& Williamson, 1987). It has a profound effect on how an individual interacts and behaves with others (Wise &King, 2008). Researchers have stated that a person's attitudes, beliefs and judgments are highly influenced by social settings (Steinberg & Darling, 1994). In a social environment, parents and peer group mutually affect an individual throughout his life. It increases well-being, self-esteem, core beliefs, empathy, as well as social maturity and academic success (Wilkinson, 2004).

The significance of this study is the allowance for an increased understanding of adolescents' social and cognitive processes comparative to psychological control, personal decision-making, social adaptation, motivation, psychological adjustment, and academic performance. A comprehensive understanding of positive and negative parental and peer effects can be used to cultivate teaching approaches designed to reinforce effective learning approaches.

Context and Review of literature

Previous research study on human development has shown that parental and peer group imperatively influence on socialization and adjustment (Steinberg & Darling, 1994). Similarly, Bandura's social learning theory (1971) stated that patterns of behaviour could be learned via a person's experience or by watching how others in their environment behave. The social learning theory shows that the way one acts can be attributed to their social context. Interestingly, Social Cognitive Career Theory (SCCT) postulated a novel effort to comprehend the processes through which people make choices, make interest and accomplish various levels of achievement in occupation and educational pursuits. The theory asserted that cognitive variables that allow people to influence their professional development as well as social domains that increase or restrict individual's action or behaviour (Lent, Brown & Hackett, 1994).During the college years, the peer group is

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the utmost powerful basis of impact on growth and development. Peer features inclined every part of student expansion i.e. (affective, cognitive, psychological and behavioural) (Astin, 1993). One of the chief aims of education is the moulding of learners into clear-thinking, well-rounded, rational, and creative associates of culture. Nonetheless, a researcher like Ryan (2000) showed that peer groups were important concerning modifications in learners' intrinsic value for college (i.e., enjoying and liking) as well as attainment (i.e., grades).

The current study hopes to develop our understanding of how parents and peer group influences on academic performance of undergraduate students. Such facts have the potential to provide insight into how educational settings could be restructured to accommodate the requirements of all adolescents to become academically motivated and successful. Notwithstanding, wide study to date, the dynamics of student motivation, learning, personal decision-making and overall performance, necessitate a continuous quest of researches, to adapt to the ever-changing concepts of social behaviour. So, this study attempts to measure to what extent parents and peers affect on attitude, thought and action of individuals. Based on conceptualization, we propose an integrated viewpoint that student's social-contextual environment effects in the domains of attitude, behaviour, cognition and academic performance.

Objectives

1. To develop psychometric properties of parental and peer influence scale of undergraduate students.
2. To evaluate the relationship between parental and peer influence with the academic performance of undergraduate students.

Hypotheses

1. There is no significant relationship between parental influence and academic performance of undergraduate students.
2. There is no significant relationship between peer influence and academic performance of undergraduate students.

Method

To develop psychometric properties of parental and peer influence scale, highly valid and reliable scale development procedures were used as recommended by DeVellis (2016). In addition, descriptive correlation study was used to evaluate the relationship among constructs. Besides, details related to respondents, the procedure of item generation and analysis of data can be seen in detail below.

Participants

The respondents in this study were undergraduate students taken from Kashmir province of Jammu and Kashmir, who were chosen through convenient sampling technique. At the first phase, 313 undergraduate students were selected to explore the factorial validity of the scale. At the second phase, 350 undergraduate students selected and confirmatory factor analysis (CFA) was implemented to confirm the components resulted from the EFA. Further, 118 participants were selected to explore the relationship between independent and dependent variables.

Item generation procedure

To develop a valid and reliable measure, present research study adapted items from contextual influences scale developed and validated by Bashir (2019). So, 46 items were selected, among them, 22 for peer influence and 24 for parental influence. Therefore, the present scale comprised 5-point Likert scale, each statement is rated on five sequential points i.e., (Always=5, frequently=4, Sometimes=3, rarely=2 and Never=1. Some items of the peer influence scale are (1)I try to cheat during the examination because many of my friends do so. (2) I spend a lot of time to discuss examination preparation/academic work with my classmates. (3) I wear dresses as per my friends' liking. For parental influence (1) I work hard to achieve high grades because my parents insist me to do so. (2) I will follow lifestyle (after intermediate/graduation) similar to that of my parents. (3) My life outside the home is under parental screening.

Analysis and discussion

The analysis of the data was conducted using IBM SPSS statistical software version 22 to perform Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) was used for further confirmation of structural validity with the help of SPSS AMOS 20 version statistical software.

Exploratory Factor Analysis of Parental Influence

Exploratory Factor Analysis for parental influence was executed with the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA) was found to be 0.914 and Bartlett's test of sphericity was significant p < .001). For parental influence, Principal Component Analysis (PCA) with a varimax method produced four facets, explaining 53.277% of the variance. Each of the statement had acceptable factor loading since it was in the range of 0.517–0.814. In this analysis, one item was deleted due to low factor loading. Further 23 items were retained to perform CFA. Factor 1 was related with psychological support (9 items); factor 2 was related with behavioural control (6 items); factor 3 was related with parental pressure (5 items); factor 4 was connected with psychological control (3 items).

Confirmatory Factor Analysis of Parental Influence

Confirmatory Factor Analysis was performed five times for model refinement, the final indices of the model- ? ² = 461.11; Df = 180; p-value = 0.000; RMSEA = 0.059; CMIN/DF = 2.562; GFI = 0.904; AGFI = 0.877; CFI = 0.900. In this analysis, 2 statements were deleted to get a better model fit and final scale consists of 21 items. Among them, 8 items associated with psychological support; 5 items associated with behavioural control; 5 items associated with parental pressure; 3 items associated with psychological control.

Reliability of Parental Influence

The reliability coefficient of parental influence scale was higher than the accepted threshold i.e., 0.6. The psychological support has an alpha coefficient of 0.807, 0.784 for the behavioural control, 0.733 for the parental pressure and 0.632 for the psychological control. The alpha value for the overall scale is .872 which is good as per the researcher (DeVellis, 2016).

Construct validity of Parental Influence

The construct reliability (CR) values for the four factors were 0.899, 0.825, 0.833 and 0.737 for psychological support, behavioural control, parental pressure and psychological control respectively. Based on these four benchmarks, each element has acceptable convergent validity because the value of Average Variance Extracted (AVE) is < 0.5. Consequently, these facets reveal the construct validity of the measure. Similarly, the reliability, factor loadings also provide robust proof for the construct validity.

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Exploratory Factor Analysis of Peer influence

For peer influence, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was found to be .926 (the minimum acceptable coefficient is .60) and Bartlett's test of sphericity was significant p < .001). Principal Component Analysis (PCA) with a varimax method produced four facets, explaining 54.651% of the variance. Each of the statement had acceptable factor loading as it was in the range of 0.437–0.762. The name of the component was given based on an association between the item and the literature (Bashir & Bala, 2018). Factor 1 was associated with peer influence on academics (10 items); factor 2 was associated with social adaptation (5 items); factor 3 was associated with personal decision making (5 items); factor 4 was associated with psychological adjustment (3 items).

Confirmatory Factor Analysis of Peer influence

Confirmatory Factor Analysis was performed, consequently, a number of improved run was carried on and the results of data for fit indices shown perfection in every stages and last result derived to moderate fit as- ? ² = 4 72.47; Df = 181; p=000, RMSEA = 0.060; CMIN/DF=2.610; GFI = 0.904; AGFI = 0.878; CFI = 0.922. In this analysis, 2 statements were deleted to get a better model fit and final scale consists of 21 items. Among them 8 items associated with academics; 5 items each associated with social adaptation and personal decision making; 3 items associated with psychological adjustment.

Reliability of peer influence

The peer influence on academics, social adaptation, personal decision-making factors has an alpha coefficient of 0.815, 0.799, 0.624 and 0.639 for psychological adjustment respectively. Moreover, the alpha values for peer influence scale was found to be 0.912, which is excellent as per researchers (DeVellis, 2016).

Construct validity of peer influence

The construct reliability (CR) values for the four factors were 0.88, 0.831, 0.829 and 0.858 for peer

influence on academics, social adaptation, personal decision making and psychological adjustment respectively. The academics component gained 0.52 value of Average Variance Extracted (AVE) but the value gained by other components were>0.50. Based on these four benchmarks, each element has acceptable convergent validity.

Results of Relationship of Academic Performance with Parental and Peer Influence

The study hypotheses were examined using Karl Pearson's coefficient of correlation. The results are presented in the following tables:

Table 1

Summary of the relationship between Parental Influence and Academic Performance

Construct(s)	Psycho logical Support	Behavioural Control	Parental pressure	Psycho logical control	Parental influence
Academic Performance	.188*	0.127	.191*	0.005	.201*

* 0.05 level of confidence

The results presented in Table 1 shows the calculated value of r = .188* between academic performance and psychological support confirms a positive and significant relationship. Similarly, the table further delineates a positive but insignificant association between academic performance and behavioural control (r = .127). On the other hand, a positive and significant relationship was found between academic performance and parental pressure (r = .191*) among undergraduate students. While an insignificant relationship was found between academic performance and psychological control (r = .005). Overall parental influence and academic performance are positively connected (r = 201*) with each other at 0.05 level of confidence. Thus, it can be said that parental influence affects positively on academic performance among undergraduate students.This result is also coherent with the findings of Markowitz (2013) found that parental involvement has both negative and positive influence on students' performance.

Table 2

Summary of the relationship between Peer Influence and Academic Performance

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Construct(s)	Peer influence on Academics	Social adjustment	Personal decision making	Psychol ogical adjust ment	Peer influence
Academic Performance	.192*	.237*	0.131	0.005	.204*

*0.05 level of confidence

The results in Table 2 revealed that the calculated value of r = .192* between academic performance and peer influence on academics confirms a positive and significant relationship. Similarly, the table further delineates a positive and significant association between academic performance and social adjustment (r = .237*). On the other hand, a positive but insignificant relationship was found between academic performance and personal decision making (r = .131) among undergraduate students. While an insignificant relationship was found between academic performance and psychological adjustment (r = .005). Overall peer influence and academic performance is positively correlated (r = 204*) with each other at 0.05 level of confidence. Thus, it can be said that peer influence affects positively on academic performance among undergraduate students.This result is also coherent with the findings of Olalekan (2016) found a significant association between peer influence and academic performance. While as Celant (2011) found peer effects are significant determinants of performance. Moreover, You (2011), in his research revealed that peers have a significant influence on the behaviour and development of adolescents.

Conclusion

The results of the study revealed that parental and peer influence scale is a highly reliable and valid instrument. The study concluded that parental influence as well as peer influence conceptualized into four components. Findings revealed that present measure adequately fulfills reliability and validity procedures of scale development; therefore it can be administered to explore the parental and peer influence of students. Also, a significant correlation was found between parental and peer influence with the

academic performance of students. It implies that positive parental and peer influence might develop better academic success among undergraduate students.

Limitations and future research

In this study, the investigator adapted extremely valid and trustworthy scale measurement techniques but still, it suffers from some drawbacks. The main drawback is that EFA and the CFA are relatively sampled size-specific methods. Researcher in this research study has a justification and appropriate literature provision for using these methods but in demand to have superior outcomes a larger sample size is advisable. The results provide further provision for using psychometric analysis on the parental and peer influence scale. Items should be added, deleted, or revised to improve stability of peer influence and parental influence scale to make certify that similar items are measuring each of the constituents. Future research can be conducted to determine the association between parental and peer influence with student academic and extra-curricular engagement. This study also suggests that follow up investigation with this measurement should be conducted in various academic levels like secondary, higher secondary and university students.

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INFLUENCE OF EMOTIONAL INTELLIGENCE ON ACADEMIC STRESS AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT

The present study explored the emotional intelligence, academic stress of secondary school students in the Chennai city (south). Using random sampling technique 111 students, from the Secondary level IX and X standard student is chosen. The Emotional Intelligence Test (EIT - Sharma, 2011) and Academic Stress Scale (Constructed by the investigator) are used to assess the Emotional Intelligence and Academic Stress of Secondary school students. The data was collected and analysed by Correlations Analysis using SPSS Package. The results of this study revealed a Negative relationship between Emotional Intelligence and Academic Stress among the Secondary school students.

Keywords: *Emotional Intelligence, Academic Stress, Secondary school Students.*

Introduction

Because of globalization, the education system has updated to meet the needs of the changing world both in the developing and in the developed countries. As a result, several new disciplines have been introduced to make students competent and thus the students are expected to shoulder many responsibilities. Apart from studying the main curricula subjects, students were also involved in many co-curricular activities. Due to this reason, students are often facing difficulties to complete the assigned task. Apart from this, students belonging to the adolescence stage: shows poor mental health, involve in anti-social and risk-taking behaviours. Further, Blazer (2010) found that students get more pressure from teachers, parents and also experience difficulties during admission, to get good school point, score more marks in internal tests, and to take part in school competitions, achievement, curricular and co-curricular activities. In this context, all these changes seriously affect the teenagers resulting in lack of interest in curricular and co-curricular activities. According to the American Psychological Association (2014) report, the number of counselling receiving students has been increased significantly in the year 2013 when compared to 2010. Students show a lack of interest and perform low in social, emotional, cognitive and physical development. Also, they possess poor mental health due to various stressors.

To make the students to feel better and to challenge the various stressors, the policymakers, educationist, researchers, teachers along with parents attempting to identify the effective strategies. Those strategies include yoga, physical exercise, meditation, hearing motivational speech and emotional intelligence. These strategies aid the students in reducing the stress owing to academics and other personal issues. The investigators in this paper attempted to find out the effect of one such strategy i.e. Emotional Intelligence (EI) in reducing the academic stress (AS) among secondary school students.

In the present study, the investigators adapted the definition of EI given by Goleman (1995) where he refers EI as 'the ability to know and manage one's own emotions, recognize them in others and handle relationships'. Further, the investigators refer academic stress as a type of stress that arises due to academic factors such as heavy school schedule, unrealistic expectation and demands of parents and teachers, low academic performance, poor study habits and not having enough time to deal with school's multiple responsibilities (as defined by Banerjee, 2011).

The significance of emotional intelligence is well researched and documented since 1980. The individuals

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having a high level of EI are supposed: to perform better in interpersonal and intrapersonal relations, show improved consequences in leadership, academic achievement, physical condition and relationship (Godati, Bhagyalakhmi and Hemalatha, 2015) and, possess good logical reasoning (Lam, Thi and Kirby, 2002).

Studies by Cejudo, Rodrigo-Ruiz, Lopez-Delgado & Losada, (2018), Miri, Kermani, Khoshbakht & Moodi, (2013) and Extremera, Durán & Rey,(2007) shows that there was a significant negative relationship between emotional intelligence and academic stress among the school students.

Objective: The objective of the present study is to identify the type of relationship between the dimensions of EI and academic stress of secondary school students.

Hypothesis: There exists a significant negative relationship between the dimensions of the emotional intelligence and the dimension of the academic stress of the Secondary school students.

Methodology

Method and Sample of the study: Survey method is used to collect the quantitative data from 111(response rate 64 %) IX and X standard secondary school students (selected using simple random sampling procedure) belonging to the age group of 14 – 16 years studying in the schools of Chennai (South) city.

Research Tools Used: The data was collected using 1) Emotional Intelligence Test (EIT) a standardized tool developed by Sharma (2011) following Goleman Model (1995) of EI. This self-reported EIT consist of 60 items with 5 dimension viz. Self-Awareness (EI1), Managing Emotions (EI2), Motivation Oneself (EI3), Empathy (EI4), and Handling Relationships (EI5). Responses are invited on a five-point scale ranging from 'always, most often, occasionally, rarely and never' having a score of 1-2-3-4-5 for positive items and reverse scoring for the negative items. This test possesses construct validity and internal reliability ranging from 0.66 to 0.84. Also, the test has a Cronbach alpha of 0.74. 2) Academic Stress Scale (ASS) constructed by the investigators that includes48 items with 6 dimensions (Self-inflicted / Personal Stress-AS1, Stress from Teachers-AS2, Stress from Parents-AS3, Exam Stress-AS4, Stress from Peer-AS5 and Stress from School-AS6). The responses (strongly agree, agree, neutral, disagree and strongly disagree) are scored between 5 and 1. The reliability value of the ASS is 0.89 by using Cronbach alpha. The intrinsic validity is 0.78 established using the reliability values. Further, ASS possessed adequate content, face and construct validity as the test items measure the academic stress of the students.

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Data Collection: The data was collected from the sample by using the translated version (Tamil) of the research tools. The investigators personally visited the students in the respective schools and collected the data. before the administration, instructions were given as how to fill the research tools.

Statistical Technique used: Pearson product-moment correlation was used to analyze the statistical data. The data were analysed using the Statistical Package for the Social Sciences software package (SPSS-22).

Results and Discussion

Relationship between Emotional Intelligence and Academic Stress of the Secondary School Students

Hypothesis 1 : There exists a significant negative relationship between the dimensions of the emotional intelligence and the dimension of the academic stress of the Secondary school students.

Table 1

Correlation between the Dimensions of Emotional Intelligence and Academic Stress of Secondary School Students

EI AS	Personal Stress	Stress from Teachers	Stress from Parents	Exam Stress	Stress from Peers	School Stress	AS Total
EI 1	-0.641**	-0.670**	-0.622**	-0.694**	-0.667*	-0.688**	-0.726**
EI 2	-0.537**	-0.585**	-0.509**	-0.547**	-0.482**	-0.577**	-0.590**
EI3	-0.566**	-0.560**	-0.531**	-0.605**	-0.555**	-0.557**	-0.615**
EI4	-0.533**	-0.548**	-0.560**	-0.552**	-0.514**	-0.570**	-0.596**
EI5	-0.430**	-0.437**	-0.333**	-0.487**	-0.479**	-0.485**	-0.485**
EI Total	-0.652**	-0.673**	-0.613**	-0.695**	-0.650**	-0.693**	-0.725**

Note: ** significant at 0.01 level.

From the above table, the stated hypothesis, there is a significant negative relationship between the dimension of the emotional intelligence and the dimension of the academic stress of the secondary school students studying in the Chennai city is accepted as the calculated r-values report that there is a significantly strong negative relationship between each of the dimension of emotional intelligence.

From the above discussion, it is clear that the first dimension of the emotional intelligence i.e self-awareness (EI1) has a significant and strong negative relationship with all the dimensions of the academic stress i.e personal stress (-0.641), stress from teachers (-0.670), stress from parents (-0.622), exam stress (-0.694), stress from peers (-0.667), stress from school (-0.688) and total academic stress (-0.726) as the calculated r-values are significant at 0.01 level. A similar type of relationship is observed between all the other dimensions of emotional intelligence managing stress (EI2), motivating oneself (EI3), empathy (EI4) and handling relationship (EI5) and total emotional intelligence (EI total) have a strong significant negative relationship with each of the academic stress dimensions i.e personal stress (AS1), stress from teachers (AS2), stress from parents (AS3), exam stress (AS4), stress from peers (AS5), stress from school (AS6) and total academic stress (AS total). As the relationship is negative, the higher the emotional intelligence of the secondary school students, the lower will be their academic stress. Thus the sated above hypothesis is accepted.

The analogous findings are verified by the results of the studies by Ramesar, Koortzen & Oosthuizen, (2009), Noorbakhsh, Besharat & Zarei, (2010), Gupta, Koolwal & Gehlot, (2014), Masum & Khan, (2014), and Watson & Watson, (2016)where a significant negative correlation was reported between the emotional intelligence and stress management; emotional intelligence and coping styles with stress; perceived stress and emotional intelligence; emotional Intelligence and aggression and; self-efficacy and academic stress in college students. Similarly, the studies by Landa, Lopez-Zafra, Martos, Aguilar-Luzon, (2008) andPor, Barriball, Fitzpatrick & Roberts, (2011) has demonstrated a negative relationship between the emotional intelligence and occupational stress and; emotional intelligence and stress among nursing students.

Also, the results of Cejudo, Rodrigo-Ruiz, Lopez-Delgado & Losada, (2018), Miri, Kermani, Khoshbakht & Moodi, (2013) and Extremera, Duran &Rey,(2007) have supported the present findings, where a significant negative relationship was found between emotional intelligence and stress; emotional intelligence and academic stress and; perceived emotional intelligence and dispositional optimism-pessimism of school students.

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Implications

As the result revealed a significant negative relationship between emotional intelligence and academic stress, there is a need to inculcate emotional intelligent skills in secondary school students to reduce academic stress. The students good in the managing emotions, self-motivating, empathy and handling relationship managed the stress arising from exam, peers and schools. This finding implies that the secondary school students shall be given several opportunities to enhance emotional self-awareness and social awareness to manage and cope with stressful situations. This can be done by integrating the emotional intelligence components in the curriculum of students.

Further, assessing emotional intelligence will help the students to know and aware of their own emotions and support them to handle it appropriately. Also, it helps the teachers to plan their teaching to enhance emotional intelligence among students. Furthermore, teachers can also plan group activities to improve emotional intelligence in students. Additionally, teachers and parents can provide the students with opportunities for intrinsic motivation (by giving positive feedback, promote positive behaviours, creates a better working environment, removes intimidations). Also, the students can involve themselves in balancing both the positive and negative emotions by self-analyzing the consequences of each emotion before exhibiting the same. Similarly, students should be trained to look at a particular issue from others point of view and also they should be provided with ample opportunity to be cordial with everyone they interact. At the same time, the parents and teachers should look out and arrest the academic stressors caused because of their expectations and behaviour.

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Continued on Page 46

THE LEARNING EFFECTS OF SIMULATION ANIMATION IN DEVELOPING SCIENTIFIC ATTITUDE AND AWARENESS: A CASE STUDY TO TEACH ENVIRONMENTAL SCIENCE TO PRIMARY AND HIGH SCHOOL STUDENTS

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ABSTRACT

This article examines the research on the learning effects of simulation animation in environmental science education, aimed at the creation of general awareness and scientific attitude among the primary level and high school level students on "Water Conservation" topic. Students within the same levels were divided into two groups, the experimental group was subjected to simulation animation approach and the control group with traditional teaching. Prior to the study, both the groups had taken a pre-test. The post-test was also conducted once the process was over t-test was performed to evaluate the significance of the variables. The results of the study suggest that simulation animation approach is highly engaging and more effective among the school students in understanding the burning issues involving the environment. The article concludes with how the effectiveness of simulation animations can be examined, the adjustment in learning strategies and inquiry process so as enable the children to enhance their scientific attitudes and perception. Recommendations are made to the teachers to motivate their students to use ICT technology.

Key words: *Learning effects, simulation, scientific attitude, environmental science.*

Introduction

Students benefit a lot with the use of technology in the classroom. If teachers understand the importance of integrating technology into their teaching of lessons and gain the professional development needed in their fields, they could become accustomed to using technology tools and thereby student learning and motivation could improve significantly. The new generation of students face a multi-tasking, multifaceted, technology driven, diverse, vibrant world and there is an urgent need to equip them so as to handle the scenario. Information and Communication Technology (ICT) provides an opportunity for progression from the traditional method of delivery to an environment; where, students learning is self-directed and they can solve real-life problems. This self-directed learning allows teachers the freedom to act as a facilitator, which can give more time for them to work with individual groups and tailor their information to the requirements of individuals (Linn, 2000). For instance, computer simulation as platform of inquiry-based science learning can offer opportunities for learners to manipulate scientific experiments that are impossible, difficult, or time consuming to accomplish in classroom settings (Rutten, 2015).Digital

game-based learning is considered helpful for promoting cognitive engagement andmotivation by providing learners with an enjoyable learning experience (Khan, 2017). Shamir and Korat (2015) considered that, in e-learning contexts, multimedia resources motivate learners to explore and relate to the learning materials, while at the same time, provoking the learners' desire to delve further into the subject and search for related information. Badia, Meneses, and Sigales (2013) conducted a study to identify the key factors that influence teachers' decision

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making regarding the educational use of ICT in technology-rich classrooms. DeCoito and Richardson (2018) explored 74 middle school teachers' beliefs about and use of technology through a technology, pedagogy, and content knowledge lens. Findings revealed that both internal and external barriers were present and influenced how teachers situated their pedagogy in terms of technology integration.

Advantages of ICT guided teaching and learning

Teachers' perspective: a) Allows teachers to engage and motivate students to a greater level b) Simulations enable teachers to show experiments that are not ordinarily possiblec) Data logging and digital video recording allow access to new sources of data in a wider range of experimental settings andd) saving lesson time and giving better quality results.

Students' perspective: a) Reduced time consumption b) more time to concentrate on interpreting and analyzing the data c) communicate with a wide variety of media, formats and platforms d) instant feedback to refine experiments and hypotheses e) provide scope for project-based learning and opportunities for self-directed learning f)access to learning resources outside the school hours g) enables students to become part of a community of learners andh) opportunities for collaboration with peers and professionals.

Animation as an effective tool in imparting scientific knowledge

Animation is one area that can add value to the course content and enable the student to learn quickly and easily. Simulation of an experiment using animation will enhance the learning abilities among the students (Suteewan and Suwich, 2012). According to Mayer and Moreno, animation refers to a simulated motion picture depicting movement of drawn (or simulated) objects (Mayer & Moreno, 2002). Studies conducted in several countries have demonstrated the positive effects involving the use of visualization technologies for promoting students' understanding of essential scientific concepts (Wu & Shah, 2004; Kozma& Russel, 2005). While many researchers find it appealing to use animations in their classroom, little research has been done to determine if animation improves the learner's understanding or enthusiasm for environmental issues and how simulations can be designed and used most effectively. The main aim of this study was to compare the effect of "water saving" concept learning with animation short films and traditional learning without computer simulations on school students. In this study, the authors examine the following questions: Is there any statistically significant difference between environmental science learning with simulation animation and traditional learning without simulation animation? Do students find simulation animation as a positive learning experience?

Significance of the study

According to a Central Water Commission assessment summarized by News18, 65 percent of India's reservoirs are running dry, with 59 out of 91 reporting below normal water levels. As per a 2018 report by Niti Aayog, a government policy think tank, 600 million people across India face high to extreme water shortages. We need to meet these challenges to safeguard the earth and the future of our children. It is high-time, we need to mend the young minds and create awareness on water conservation. Hence, attempts have been made in this work to teach the importance of "water saving" and to catch the attention of the school children by screening a few award winning animated films.

Objectives

1. To find out the significant difference between pre and post-test mean achievement scores in the control group.
2. To find out the significant difference between pre and post-test mean achievement scores in the experimental group.
3. To find out the significant difference between control and experimental group in the pre-test mean achievement scores.
4. To find out the significant difference between control and experimental group in the post-test mean achievement scores.
5. To find out the level of satisfaction of the experimental group after exposure to simulation animation approach.

Hypotheses

1. There is no significant difference between pre and post-test mean scores of control group of Vth standard.

2. There is no significant difference between pre and post-test mean scores of control group of IXth standard.
3. There is no significant difference between pre and post-test mean scores of experimental group of Vth standard.
4. There is no significant difference between pre and post-test mean scores of experimental group of IXth standard.
5. There is no significant difference between control and experimental groups in pre-test mean scores of Vth standard.
6. There is no significant difference between control and experimental groups in pre-test mean scores of IXth standard.
7. There is no significant difference between control and experimental groups in post-test mean scores of Vth standard.
8. There is no significant difference between control and experimental groups in post-test mean scores of IXth standard.
9. There is no significant difference between satisfaction level of experimental groups of both Vth and IXth standard class students.

Methodology

In the present study, the investigators have employed the quasi-experimental design in order to conduct the study regarding the perspective of the students both pre and post treatment. In this research method, a teacher was assigned to teach two teaching sessions of the same topic (Water conservation). Table 1 presents the list of the animated movies along with the web-link. The quasi-experimental design comprises two groups in which one group is subjected to experiment and whereas the other group functions as a control group (Fraenkel & Wallen 1996). The control group followed the traditional method while the experimental group subjected to simulation animation approach. Before the study, all the participating students had taken a pre-test and these scores were used to examine the equivalence of the two groups and to analyze their performance. The post-test scores were used as the dependent variables. At the end, the satisfaction level of the experimental group was evaluated to ascertain the influence of simulation animation.

Table 1

List of the animated short films screened

1	Best animation Short film on Saving Water of 2016 "Tanker Man",
	Commander films**https://www.youtube.com/watch?v=NIO9u8soR14**
2	Save Water for the future – (Save Water Awareness Animation short film 2016) Siya Manjrekar Productions. Director - Santosh R Manjrekar. **https://www.youtube.com/watch?v=9yqejA041Z8**
3	WHY SAVE WATER?,Panton studios**https://www.youtube.com/watch?v=s_ZmdrQBsZ4**
4	Save Water Animation cartoon,by SalamMajid**https://www.youtube.com/watch?v=hoyAh1KSktY**
5	"Let's Go Save Water" - PUB Water Conservation Animation
	https://www.youtube.com/watch?v=ZcCAkWT7df4
6	SAVE WATER, by ParvinderBaisoya**https://www.youtube.com/watch?v=IZNTnxhoU1k**
7	Save Water, by Point Strokes **https:// www. youtube.com / watch?v=yQn8TKd1cVg**
8	Water Conservation Animation, by RiyajNerontor**https://www.youtube.com/watch?v=B4ZR53n0D8I**
9	THE LIFE OF WATER. WATER WHICH GIVES LIFE - Water ProjectH2Ooooh!, Gruppo Alcuni in collaboration with UNESCO Venice Office, **https://www.youtube.com/watch?v=FAnDlYRycqs**
10	Water Is Life - Short 2D Animation, Sinyee Loke, **https://www.youtube.com/watch?v=cL44eB1Wf1s**

Population, sample and tools used

The investigators had chosen two Chennai schools run by the corporation of Chennai (Chennai Hr. Sec. school, Choolaimedu, Chennai-94 & Chennai Hr. Sec. school, Subbarayan Street, Chennai-30), where both the schools follow a uniform system of school education. 60 students were selected from class V and IX of both the schools employing the stratified random sampling technique for the case study. They were further divided into two groups (30 each) namely, the control and experimental groups. The performance test was developed and standardized, the tool consisted of 30 multiple choice questions. 10 questions were aimed towards assessment of students' attitude toward the learning of the topic under study. 10 questions

were aimed on the influences of learning framework related to the awareness level of the student, and 10 questions were connected with the cognitive skills such as students' ability to think and reason. At the end, the experimental group was given 10 questions with 5 level scale: excellent, very good, good, ordinary and not good to examine the satisfaction level of the students.

Analysis of data

In order to compare the effects of the two teaching approaches, the obtained data were analyzed with statistical techniques by calculating the arithmetic mean, standard deviation and independent 't' test. Further, the students' scores were calculated by the normalized gain (Hake, 1998), and accordingly the three ranges of 'g' are interpreted as, low (0-0.3), medium (0.3-0.7) and high (0.7-1).

$$g = \frac{\text{Actual gain}}{\text{Max. Possible gain}} = \frac{(\text{Post} - \text{Test}) - (\text{Pre} - \text{test})}{\text{Max. score} - (\text{Pre} - \text{test})}$$

"g" measures the percentage improvement of the post-test score relative to the pre-test score compared with the maximum amount of improvement that could have achieved.

Hypothesis 1: There is no significant difference between pre and post-test mean scores of control group of Vthstandard

Table 2

Std. V- control group pre-test and post-test

Groups	No. of students	Mean	S.D	Mean Difference	't' value	Gain 'g'
Pre-test	30	5	2.639	6.733	1.440679	0.296525
Post-test	30	11.733	3.161551			

The students who took the pre-test have a mean of 5 and 2.6 as S.D. While in the case of the post-test we see a nearly double increase in the mean and a mild increase in the SD, 11.733 and 3.161, respectively. A mean difference of about 6.733 is significant with a 't' value of 1.440. As the difference between them is significant and the hypothesis is rejected. Moreover, the Hake gain was calculated and estimated to be low.

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Hypothesis 2: There is no significant difference between pre and post-test mean scores of control group of IXth standard.

Table 3

Std. IX- control group pre-test and post-test

Groups	No. of students	Mean	S.D	Mean Difference	't' value	Gain 'g'
Pre-test	30	12.9	1.660321	5.6	4.9455	0.31976
Post-test	30	18.5	2.986079			

A similar trend is seen also in the case of the IXth standard students in both the pre-test and the post-test scores indicating that the hypothesis can be rejected, with a mean difference of 5.6 and 't' value of 4.9454. Thus, it is concluded that there is a significant difference between control groups of both standard Vth and standard IXth students in their pre-test and post-test scores.

Hypothesis 3: There is no significant difference between pre and post-test mean scores of experimental groups of Vth standard.

Table 4

STD. V- Experimental group pre-test and post-test

Groups	No. of students	Mean	S.D	Mean Difference	't' value	Gain 'g'
Pre-test	30	5.4667	2.54	11.43	2.2133	0.64047
Post-test	30	16.9	2.68			

In the results of the experimental group of the Vth standard we could see the mean for the pre-test is 5.4667 while in the post-test, the mean shoots up to 16.9 with a mean difference of 11.433 and the 't' value is 2.2133. Eventually, resulting in the failure of the hypothesis. The Hake gain is calculated to be 0.64047 and is found to be medium gain.

Hypothesis 4: There is no significant difference between pre and post-test mean scores of experimental groups of IXth standard.

Table 5

STD. IX- Experimental group pre-test and post-test

Groups	No. of students	Mean	S.D	Mean Difference	't' value	Gain 'g'
Pre-test	30	12.933	1.669285	14.07	5.4084	0.875177
Post-test	30	27	1.59645			

While in the case of the IXth class students, we find the mean difference between pre-test and post-test scores as 14.067 and the calculated 't' value being 5.4084. The gain is calculated to be high (0.875). Indicating that the hypothesis is false. Thus, the results of experimental groups of standard V and standard IX indicate vast improvements in the performance of the students after subjecting to simulation animation teaching approach.

Hypothesis 5: There is no significant difference between control and experimental groups in pre-test mean scores of Vth standard.

Hypothesis 6: There is no significant difference between control and experimental groups in pre-test mean scores of IXthstandard.

Hypothesis 7: There is no significant difference between control and experimental groups in post-test mean scores of Vth standard.

Hypothesis 8: There is no significant difference between control and experimental groups in post-test mean scores of IXthstandard.

Table 6

Results of comparison of pre-test and post-test scores of Vth & IXth GROUPS

Schemes	Group	N	M	SD	df	G
Pre-test	Control (V^{th} Std.)	30	5	2.639	29	0.0186
	Experimental (V^{th} Std.)	30	5.466	2.54	29	
Post-test	Control (V^{th} Std.)	30	11.733	3.161	29	0.3838
	Experimental (Vth Std.)	30	16.9	2.68	29	
Pre-test	Control (IXth Std.)	30	12.9	1.66	29	0.00192
	Experimental (IXth Std.)	30	12.933	1.669	29	
Post-test	Control (IXth Std.)	30	18.5	2.986	29	0.7391
	Experimental (IXth Std.)	30	27	1.596	29	

The discussion related to hypotheses from 5 to 8 are based on Table 6, in the first case (hypothesis 5), we observe a mean difference of about 0.466 and S.D. difference of 0.099 and gain of 0.0186, suggesting a low gain and thus proving hypothesis 5 is true. While in the post-test of the control and experimental groups of the Vth standard and IXth standard, we witness a gradual increase in the mean and S.D. with a gain of 0.00192 and the gain is the lowest, proving that the Hypothesis 6 is also true. On the other hand, while calculating the post-test scores we see a mild mean difference of about 5.167, and with a SD difference of 0.481 and a gain in the range of 0.38 indicating a mild gain, leading to a conclusion that Hypothesis 7 is false. Eventually, in the last case (Hypothesis 8) we see a mean difference of about 8.5 and a S.D. difference of 1.39 and with a gain of 0.7 indicating a high gain, ascertaining that Hypothesis 8 is false.

Table 7

The details of level of satisfaction of the Experimental group

S.No.	Questionnaire	Mean		S.D.		Satisfaction level	
		V^{th}	IXth	V^{th}	IXth	V^{th}	IXth
1	The content is interesting	9.5	8.6	0.16	0.29	Highest	High
2	Animation learning supports students	9.5	9	0.16	0.11	Highest	Highest
3	Animation learning is provocative	9.8	9.3	0.46	0.41	Highest	Highest
4	Animation learning is engaging	9	8.5	0.34	0.39	Highest	High
5	The visual and audio quality is excellent	9	8.9	0.34	0.01	Highest	High
6	Animation presentation simulates the situation	9	9.1	0.34	0.21	Highest	Highest
7	Animation learning is funny and playful	9.9	8.5	0.56	0.39	Highest	High
8	The methodology in animation learning is effective	9.5	9.2	0.16	0.31	Highest	Highest
9	Simulation learning promotes self-learning	9	9	0.34	0.11	Highest	Highest
10	Simulation learning can be repeated to establish better understanding	9.2	9.2	0.14	0.31	Highest	High
	Total	9.34	8.93	0.108	0.081	Highest	Highest

Findings and discussion

The result of this research with simulation animation to teach the lessons of environmental science are of very high quality (Mean= 16.9, S.D=2.68) for the Vth standard and (Mean=27, S.D.=1.596) for the IXth standard students and the satisfaction level of students is the highest *4.*

(Mean=9.34, S.D=0.108) for the Vth standard and also highest (Mean=8.93, S.D.=0.081) for the IXth standard students. However, there are a few areas in which the satisfaction level between standard V and standard IX students is slightly different. For example, class V students seemed to have enjoyed and experienced more fun and bit playful in the learning process, possibly the age factor and first time exposure is responsible for the observed changes between the relatively junior students than the class IX students. It is quite evident that the senior students have approached the learning process in a more serious mood and ambience compared to their junior counterpart. In addition, the results of the comparative testing scores exposed that post-test score is higher than pre-test score with the mean difference of 5.466 and 16.9 for the Vth standard students and 18.5 to 27 in the case of the IXth students. The causes of learning achievement of the students are of high score and are very different between the two tests.

Recommendations

In this study we used the animation by itself. There was no communication between students and the teacher. Every student followed the animation individually. In future, we should find out if there are any variations, when a teacher uses the animation as a visualization tool in the lesson.ICT should be infused into the curriculum, giving students the opportunity to work collaboratively on self-directed learning, complex thinking and problem solving. Government should provide modern technology tools to schools where they are not sufficiently available. School administrators should organize educational technology programs for training science teachers who lack expertise in technology use.

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EFFECTIVENESS OF DATABASE TECHNOLOGY IN ENHANCING LEARNING OF PHYSICS AT HIGHER EDUCATION LEVEL

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ABSTRACT

Technology has revolutionized all spheres of life. Higher education requires radical changes to meet out the challenges in the present scenario. Learners should be empowered to revolutionize the learning experience in this technology–rich environment. Physics is one of the challenging disciplines at the higher education level due to its heavy emphasis on theoretical concepts, practical applications and problem solving nature. Higher education in India refers to the education programmes after higher or senior secondary level. Learners are facing difficulties in adapting themselves into the personalized approach in learning. The importance of personalized learning and task based learning is realized in this technology oriented environment. With the advent of computer technology individualized, interactive and learner centred environment can be created. Database technology is one of the application oriented branches of computer technology. The researcher developed interactive software using the database management system for storing, modifying, extracting and searching physics concepts within database. The researcher has used the experimental method in studying the effectiveness of database technology in learning physics. The results showed that the database software developed by the researcher helped the learners in understanding physics concepts and solving complex problems easily.

Keywords: *Cognitive variables, Database Software, Database Technology, Physics Education*

Introduction

Physics is one of the important subjects at the higher education level. Many students are showing interest in studying physics as a major subject. Physics is the base for many professional programmes. There are many challenges in learning of physics at all levels, especially at the higher education level. Learners should be well versed in both theoretical as well as practical physics. The one-to-one initiative will allow the learner to equip themselves well in theory as well as practical. Technology-Enabled learning is the application of some form of digital technology to teaching also learning in an educational context (Kirkwood and Price, 2016). Database technology is one of the emerging fields of modern technology. The software package developed for learning physics will assist the learner in searching the content from various kinds of resources, store it and retrieve it whenever and wherever needed. Database technology provides an internal representation of the external world of interest (Govindarajan, 2019). The Database software prepared for this study will be a personalized repository on which learner can store all kinds of learning materials related to physics concepts. Learner can arrange the content as per their desire. They can easily manipulate the information within the database. In order to study its effectiveness in learning physics, the pre-test and post-test experimental design was constructed. The sample was divided into different groups like the Experimental group and Control group. The experimental group was exposed with the database software while the control group was allowed to learn through a conventional method. Statistical analysis was carried out based on the data collected for this study.

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Statement of the problem

The researcher has developed a software package using database technology which will enable the learner to store, manipulate, update and retrieve the learning resources according to their learning ability. The researcher also attempted to study its impact on learning physics at undergraduate and postgraduate level. Hence the research study is 'Impact of Database Technology on Selected Cognitive Variables in Enhancing Learning of Physics at Higher Education Level'.

Review of related literature

Review of literature is an essential part of academic researches which helps the researcher familiar with the background of the study, previous researches, the writings of experts in the field, and unsolved problems for the development of the study undertaken.

Abhaykumar(2018) in his research article highlighted the innovations in the field of information and communication technology. In his view, the focus of technological integration into education cannot be different from the central concerns of education which are to improve the quality of education.

Anupama Chodha(2018) have studied the effect of data mining techniques in educational applications . She prepared an efficient clustering algorithm. The Handbook of research on knowledge management using data mining suggested a suitable algorithm for knowledge management.

Bhupathi Chakrabarti(2015) has conducted a survey about the problems faced by the students in learning physics in Indian schools and colleges. In his research article, he pointed out that many students in UG colleges have a target to go for PG studies and research. But most of the degree colleges are not in a position to orient the majority of their students to research activities. Dewi Sartika and Nur Aisah Humariah (2018) studied the problem-solving skill among the learners of physics. Many students find it difficult in problem solving. The lack of learning resources is one of the reasons for this problem. Students generally find it difficult to link the problem with the appropriate the theoretical concept. The success of students is the main aim of education on tertiary education level. They are concentrating mainly on theoretical part.

Objectives

1. To study the impact of database software among the learners of physics at the higher education level.
2. To compare the performance of learners who preferred the database technology with the students who preferred the conventional learning.
3. To find out the level achievement of learners on selected cognitive variables like Remember, Understand and Application.
4. To find out the impact of database technology among the learners at UG level and PG level
5. To study the influence of locality of learners in using database technology for learning physics

Hypotheses

1. There is a significant difference between the performance of learners who preferred the database technology with the students who preferred the conventional learning.
2. There is a significant difference in the achievement of learners on selected cognitive variables like Remember, Understand and Application in learning physics with the help of database technology
3. There is no significant difference between the undergraduate students and postgraduate students in their achievement in learning physics with the help of database technology
4. There is no significant difference between the students from the rural background and the urban background in using database technology for learning physics

Sample frame

The students at the undergraduate level opting for physics as a major subject and the postgraduate students of physics in the Bharathidasan University, Tamilnadu, India formed the population of the study. 124 students were selected as the sample from the purposive sampling method. There were 63 students in the experimental group and 61 students in the control group.

Variables selected for the study

The treatment variables were the learning strategies namely using the database software package and the

Conventional method of learning. The independent variables are the level of learning like UG and PG level and the locality. The dependent variable was "Achievement of the students".

Tools used

The researcher in consultation with the experts in software development and professors who are teaching physics for undergraduate students and postgraduate students at various colleges has developed the database software. Students in the experimental group were registered and used the tool for learning physics. It is still available in the following IP address: http://139.59.57.143/cvlp. Another tool was achievement tests for pre and post-tests developed by the investigator. Achievement test was conducted separately for Undergraduate and Postgraduate students in the selected course. In this study, t-Test was used for statistical analysis.

Development of database software

The database software developed for this purpose is interactive and user friendly. Students can operate the software through their login credentials. Captcha code was used in order to tell computers and human apart. They can view the syllabus prescribed by the university for the selected course. The Learner should type the unit number, unit name and name of the topic on the main page. At this stage, if the learner wishes to access the website then students should open and search the content.

They can type or load the content in the area provided for this purpose. Students can store the URL of the web page in the 'Source' tab. This will enable them to revisit the website for reference. The learner can directly type the content from the book or their own notes. There is a provision for saving the content and taking printout. This can be done by clicking ' Print my Learning material' The 'Clear' tab will make all the parts of the working space blank to enable the learner to store the next subsequent content. The admin database will keep all the records. Admin database has the overall control. Registration for the utilization of software can be done by the admin database only. Thus there are three databases in this system namely, Database for a user account, Database for admin and User database

Analysis and interpretation

Hypothesis 1 : There is a significant difference between the performance of learners who preferred the database technology with the students who preferred the conventional learning.

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Table 1

Comparison of Post Test scores

Group	Size (N)	Mean (?)	SD	Calculated 't' value	Remark at 5% level
Experimental	63	32.21	6.13	6.21	S
Control	61	15.20	1.98		

From Table 1 it is observed that the students in the experimental group performed better than the control group. The hypothesis is accepted at 0.05 level of significance

Hypothesis 2 : There is a significant difference in the achievement of learners on selected cognitive variables like Remember, Understand and Application in learning physics with the help of database technology

Table 2

Comparison of mean gain Scores with respect to cognitive variables

Cognitive variable	Group	Size (N)	Mean gain score	SD	Remark at 5% level
Remember	Experimental	63	8.15	3.56	S
	Control	61	2.42	1.33	
Understand	Experimental	63	1.72	1.63	S
	Control	61	0.21	1.07	
Apply	Experimental	63	1.2	1.33	S
	Control	61	0.47	0.51	

From table 2 it is inferred that the mean gain scores of the experimental group and control group differed significantly at 0.05 level of significance in all the three variables viz. remember, understand, apply. The higher mean scores of the experimental group indicated that their performance in remember, understand and application of the concept were better than the students who used the conventional learning method. The hypothesis is accepted at 0.05 level of significance.

Hypothesis 3 : There is no significant difference between the undergraduate students and postgraduate

students in their achievement in learning physics with the help of database technology

Table 3

Level-wise Comparison of mean gain scores

Cognitive variable	Group	Size	Mean gain score	SD	Remark at 5%
Remember	Undergraduate	35	8.32	4.06	NS
	Postgraduate	28	8.56	3.33	
Understand	Undergraduate	35	1.56	1.56	NS
	Postgraduate	28	1.53	2.12	
Apply	Undergraduate	35	1.15	1.54	NS
	Postgraduate	28	1.18	1.33	

From Table 3, it is inferred that the mean gain scores of undergraduate and postgraduate students did not differ significantly at all the three variables viz. remember, understand and apply. The mean scores obtained by the undergraduate students and postgraduate students were equal. It is concluded that both undergraduate and postgraduate students performed equally when they used database technology for their learning. The hypothesis is accepted at 0.05 level of significance

Hypothesis 4 : There is no significant difference between the students from the rural background and the urban background in using database technology for learning physics

Table 4

Locality-wise comparison of mean gain scores

Cognitive variable	Group	Size (N)	Mean gain score	SD	Remark at 5% level
Remember	Rural	40	8.3	4.01	NS
	Urban	23	7.52	1.67	
Understand	Rural	40	1.72	2.01	NS
	Urban	23	1.96	1.92	
Apply	Rural	40	1.23	1.47	NS
	Urban	23	1	2.09	

From Table 4, it is inferred that the mean gain scores of the rural background students and urban background students who have used the database technology did not differ significantly at 0.05 level of significance in all the levels viz. remember, understand and apply. Hence it is concluded that both the rural background students and urban background students performed equally well.

The hypothesis is accepted at 0.05 level of significance.

Findings

The achievement level of the undergraduate and postgraduate students of physics who have used the database software package using database technology is better than the achievement of the undergraduate and postgraduate students who have used conventional learning methods. Database technology is found to be more effective on learner's achievement than the conventional method of learning physics at the undergraduate level and postgraduate levels. In learning physics, the database software using database technology is more effective in the realization of instructional objectives viz. remember, understand and apply than the conventional method of learning. As far as the gain in achievement is concerned, the effectiveness of the database technology is same for the students with a rural background and students with an urban background in the realization of instructional objectives viz. 'remember' 'understand' and 'apply'. In learning physics with the use of database technology, the undergraduate students and postgraduate students performed equally in the realization of instructional objectives viz. 'remember' 'understand' and 'apply'.

Conclusion

The investigator has developed the database software package with the use of database technology. The database software developed by the investigator is helpful to the learners of physics both at the undergraduate level and postgraduate level in keeping important data, study materials, facts, principles, concepts, theories and problems in physics. It is the personalized repository for the individuals. In order to examine its effectiveness in learning, this has been implemented in the Arts and Science colleges affiliated to the Bharathidasan University, Tiruchirapalli, Tamilnadu, India. Database software is an effective tool at all levels of learning. The Learner can use the software to select the desired content based on their potentiality and stored it in the database. Whenever and wherever required the content can be retrieved easily. This helps to increase the achievement level of the students in enhancing their potentiality in learning physics at all levels. In terms of cognitive variables, the effect of database software developed by using the database technology differs much from the conventional method of learning.

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STRENGTH AND DIFFICULTIES OF IN-SERVICE TEACHERS IN PATRONIZING INCLUSIVE EDUCATION

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ABSTRACT

This piece of research focuses on visionary teachers who enforce inclusive education in mainstream schools. This study was conducted under a retrospective study design a sample of 57 on the purposive sampling method. Teachers who handle special learners in the mainstream schools were the samples employed in the study under chain referral sampling. Considering the core subject of Teacher Education, the strength and difficulties of Teacher patronizing Inclusive Education were collected under three major dimensions. 't'-test and F-test were the statistical techniques used in this study to find the significant difference between the research variables and sub-variables. The findings of the research claim that female teachers are the best contributors in patronizing Inclusive Education and it also reveals that teachers are more concern about the special learners rather than concerning their experience and service in different level of school education.

Keywords : *Inclusive Education, patronage, stakeholders, special learners and mainstream schools.*

Introduction

Inclusive Education is a unique weapon designed to break the serious barrier to education called Disability. No Child Left Behind (NCLB) is the mandate of UNICEF to uphold and to support children across the world. Human dignity is important for every single human irrespective of their stages from infancy to old age. 'Eradication of being left behind' is the hidden agenda of any organization committed to Human service. The world in 2030, fully inclusive of a person with disabilities is the schema envisioned by U.N general assembly. Hence all the global citizens of this 21st century are instigated to think empathetically rather than being sympathy. Leaving no one behind is the basic fact and focal point in framing Millennium

Developmental Goals (MDG) and Sustainable Developmental Goals (SDG). 'Transforming the world' is the recent trending tag frequently used by all commercial forums. Many commercial advertisements use this trending tag to launch their product to the targeted audience irrespective of what the product is for? Sometimes social media is also using this slogan 'Transforming the world' How to transform the world? Feeling the pain of fellow human is the first step to transform the world. School is the place where children could be taught to think about fellow people. The teacher is an ambassador between individuals and society. School, the miniature society binds different individual under one roof to disconnect the feel of being neglected. In-country like India, the biggest dream of the mass is to get Formal Education for their children. People's faith in education is the strength of our schooling system. As a result, there arises the concept of Inclusive Schools. Inclusive school should be considered as a positive element rather than a problem (A. Flem et al.2004). An educationally inclusive school is one in which the teaching and learning, achievements, attitudes and well-being of every young person matters (Armstrong 2010:30) Creating a phase for the Child to participate in the society is the concern of the stakeholders of Inclusive Education.

Significance of the study

While practising Inclusive Education, no stakeholder is superior or inferior. The entire stakeholder - Student, Teacher, Parent, Administration and Public ought to give their equal contribution to creating the best platform for the child to participate in the society. In this piece of research, the investigator attempted to capture the contribution of teachers in patronizing Inclusive Education. What determines the strength and difficulties of the teachers in patronizing Inclusive Education? This research question instigates the

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investigator to steer the research. As a result, the core course for teacher preparation becomes the ultimate answer with a boomerang effect. Hence the contribution of teachers in patronizing Inclusive Education was regime with Philosophical, Psychological and sociological dimensions.

Objectives

1. To study the perspectives of In-service Teachers in patronizing Inclusive Education fewer than three major dimensions.
2. To find out the significant influences of socio-demographic factors in patronizing Inclusive Education.
3. To identify the sources to strengthen the In-service teachers' patronage towards Inclusive Education.

Null Hypotheses

1. There is no significant difference between male and female teachers in patronizing Inclusive Education and its dimensions.
2. There is no significant difference among teachers in patronizing Inclusive Education with respect to their service at different levels of school education.
3. There is no significant difference among teachers in patronizing Inclusive Education with respect to their length of service.

Methodology

Design of the study :

The study aims to investigate the phenomenon of the inclusive classroom, which means to explore the issues and problem faced by the in-service teacher while handling the special learners in mainstream schooling. The teachers were asked to respond to the questionnaire by recalling the experience. Hence based on the reference period, the study was designed under retrospective study design. Nevertheless, the nature of the investigation is Non-experimental study design.

Sample

Samples were purposive because the targets are the teachers who are working in mainstream schools with experience in handling special learners. It is proposed to plan the research at small scale since it is self-supporting. Adhering to the constraint of time and resource, Snowball sampling technique was employed for data collection. In-service Teachers working in different schools referred to one another from their known network. Through this chain referral, the investigator collected 57 samples for the study. Due to unavoidable circumstance, two respondent data sheets became void which has been already excluded from the final count of samples involved in the study.

Tools used

The investigator used 'Strength and difficulties of Teachers-Inclusive Education Questionnaire 'constructed and validated by Ugin Rositta (2018) to collect the data from the In-service teachers handled special learners in the mainstream classes. This questionnaire consists of 18 items focused on three dimensions. The perspectives of the In-service teachers were captured under philosophical, psychological and sociological aspects. To adhere the ethics of research, the personal identity of the samples were kept confidential and only three demographic variables were employed in this piece of research to find the significant contribution of the teachers in patronizing Inclusive Education.

Analysis of Data

The data collected from the purposive samples were analyzed concerning the objectives and hypotheses of the study. Further the same was subjected to descriptive and differential analyses using SPSS. The results of the statistical analysis have been summarized, tabulated and interpreted accordingly.

Findings and interpretations

Hypothesis 1: There is no significant difference between male and female teachers in patronizing Inclusive Education and its dimensions.

Table 1

Mean, Standard Deviation and 't' value for the variable Gender in patronizing Inclusive Education

Dimensions	Gender	N	Mean	S.D	Calculated 't' value	P-value	Remark at 5% level
Philosophical approach	Male	10	13.70	2.058	2.114	0.039	S
	Female	47	14.89	1.521			
Psychological approach	Male	10	12.00	1.414	2.112	0.039	S
	Female	47	13.64	2.354			
Sociological approach	Male	10	14.80	1.989	0.606	0.547	NS
	Female	47	14.43	1.729			
Patronizing Inclusive Education	Male	10	40.50	2.635	2.223	0.030	S
	Female	47	42.96	3.270			

It is evident from the above table 1 that there is a significant difference between male and female teachers in patronizing Inclusive education and its dimensions. Hence the null hypothesis is rejected. Further, it revealed from the mean scores that female teachers are more concern in practising psychological and philosophical approaches whereas male teachers are concerns in applying the sociological approach in patronizing Inclusive Education.

Hypothesis 2: There is no significant difference among teachers in patronizing Inclusive Education with respect to their service at different levels of school education.

Table 2
Mean, Standard Deviation and 'F' value for the variable Service in different Level of School Education in patronizing Inclusive Education

Dimension	Service in school Education level	N	Mean	S.D	Calculated 'F' value	P-value	Remark at 5% level
Philosophical approach	Primary school	34	14.71	1.784	0.263	0.77	NS
	Middle school	20	14.75	1.482			
	High school	3	14.00	2.000			
Psychological approach	Primary school	34	13.59	2.451	0.478	0.623	NS
	Middle school	20	12.95	2.089			
	High school	3	13.33	2.082			
Sociological approach	Primary school	34	14.44	1.894	0.871	0.424	NS
	Middle school	20	14.75	1.482			
	High school	3	13.33	2.082			
Patronizing Inclusive Education	Primary school	34	42.74	3.671	0.546	0.582	NS
	Middle school	20	42.45	2.544			
	High school	3	40.67	3.512			
	Total	57	42.53	3.285			

It is inferred from the above table 2 that there is no significant difference among teachers in patronizing Inclusive Education with respect to their service in different levels of School Education. It is proved that serving at different levels of School Education is not a matter of concern for the teachers in patronizing Inclusive Education whereas, service to the special learner become their concern. Hence it is concluded that teachers from all levels of School education contributed their best to support Inclusive Education within their available limits.

Hypothesis 3: There is no significant difference among teachers in patronizing Inclusive Education with respect to their Length of service.

Table 3
Mean, Standard Deviation and 'F' value for the variable Length of Service in patronizing Inclusive Education

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Dimension	Length of Service	N	Mean	S.D	Calculated 'F' value	P-value	Remark at 5% level
Philosophical approach	1 to 5 years	4	15.25	1.708	0.439	0.780	NS
	5 to 10 years	6	14.83	2.858			
	10 to 15 years	24	14.67	1.579			
	15 to 20 years	16	14.31	1.493			
	Above 20 years	7	15.14	1.345			
Psychological approach	1 to 5 years	4	14.00	4.082	0.229	0.921	NS
	5 to 10 years	6	13.50	1.643			
	10 to 15 years	24	13.29	1.989			
	15 to 20 years	16	13.50	2.633			
	Above 20 years	7	12.71	2.289			
Sociological approach	1 to 5 years	4	13.75	1.258	1.097	0.368	S
	5 to 10 years	6	15.17	1.835			
	10 to 15 years	24	14.75	1.675			
	15 to 20 years	16	13.88	2.187			
	Above 20 years	7	14.86	0.690			
Patronizing Inclusive Education	1 to 5 years	4	43.00	5.715	0.419	0.794	NS
	5 to 10 years	6	43.50	2.168			
	10 to 15 years	24	42.71	2.562			
	15 to 20 years	16	41.69	4.270			
	Above 20 years	7	42.71	2.563			

It is inferred from the above table 3 that there is no significant difference among teachers in patronizing Inclusive Education with respect to their length of service. Hence the null hypothesis is accepted. However, a significant difference found in the dimension -sociological approach. While comparing the mean scores, teachers in the service of more than 5 years (m=15.17) out beat other teachers and rendered their best support to patronage Inclusive Education in their classrooms.

Findings of the study

There is a significant difference between male and female teachers in patronizing Inclusive education and female teacher's contribution are comparatively higher. The second demographic variable taken for investigation is the

teacher's service at a different level of School Education. The finding reveals that serving at a different level of School Education is not a matter of concern for the teachers instead of service to the special learners becomes the concern of the teachers in patronizing Inclusive Education. Finally, the length of service was taken into consideration and the findings show that there is no significant difference among teachers in patronizing Inclusive Education to their length of service.

Educational Implications

The UNESCO Salamanca declaration (1994;11) clearly emphasize the uniqueness of each child and their fundamental rights to education and states 'Inclusion and participation are essential to human dignity and the exercise and enjoyment of human rights'. Education has become the rights of an individual and facilitating education to the individual has become the duty of the governing authorities. UN calls the states to ensure 'Effective individualized support measures to be provided in the environments to maximize academic and social development, consistent with the goal of full inclusion'(UN,2006:17) Hence joining hands with Parents and Teachers, a special learner could reach the heights of learning. Teacher's role is crucial in implementing Inclusive Education in the mainstream school. The strength of the teacher upholds and endorses the special learner in the inclusive classroom and the weakness of the teacher isolate and withdrew the special learner totally from the educational arena. Hence understanding the voice of the teacher, who handles the special learners in the mainstream, should be encouraged for their patronage of Inclusive Education.

School management and the administration should remember their service and as a token of appreciation, recognition needs to be given during annual day celebrations. Public and the Policymakers can utilize the case study of such teachers and convert them into resources. Above all, parents should build a rapport with the second parents to patronize Inclusive Education at par.

Conclusion

Every child is precious in the hands of teachers. There are certain sensible hurdles may appear now and then in the journey of patronizing Inclusive Education but it doesn't mean that the journey is coming to an end. Instead, the sailor becomes an expert to handle the rough course of the sea. The teacher who struggled with the special learner in the mainstream is the one who slowly discovered their inner potential at the later stage and revived as a super teacher. Recalling the words of Malala Yousafzai "One child, one teacher, one book, one pen can change the world", then why can't we be the one?

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EXPLORATION OF ATTRIBUTES ON ROLE STRESS OF ENGINEERING FACULTY OF ANDHRAPRADESH

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ABSTRACT

Education is illumination to human life. As the teaching profession demands a lot of works during the academic arena, it is felt overloaded and stressful. Present study aims to investigate the role of stress on the faculty of engineering colleges of Andhrapradesh. Because in recent years engineering is the most preferable field of many young Indians, as they think of wider scope of job opportunities. Pareek (2009) role stress scale was adopted for the study. The population of the study is engineering faculty members working at Nellore district of Andhra Pradesh. The 350 faculty members are selected by stratified random sampling, where stratum is the designation of the respondent. The study compared the demographics of faculty members with the items of the role stress. The findings of the study revealed that the male respondents, with 26-35 years' age group, with qualification as doctorate and working as assistant professors perceived as overloaded as one of the factors of role stress. In continuation to the above, the investigator observed that the dominants stressors are role ambiguity, role conflict, role overload, inter-role distance in the present study.

Key words: *Role Stress, Role Ambiguity, Role Conflict, Role overload, Stress Attributes, Faculty stress*

Introduction

Teaching is consistently among the top three most stressful professions (Cary Cooper,2015). "A perceived imbalance between occupational demands and the individual's ability to perform when the consequence of failure is important." (Seward, 1997; NIOSH, 1999). Stress is an inability of a human being to cope with its surrounding environment (Dobson & Smith, 2000). The top four causes of stress were 54% demands of the job, 20% from co-workers, 10% from boss, 8% from layoff fears (USA Today, February 2013). Job and personal resources negatively related to psychosocial job demands (Hannes Mayes et. al., 2015).

Role Stress of the faculty members

Job satisfaction correlates negatively with role stress variables, interpreting that role stress leads to job dissatisfaction; Pestonjee& Mishra (1999) According to Akbar & Akhter (2011) women management faculty are having high stress levels when compared male faculty members. In 2016, Wakoli identified that attributes like long working hours, non-teaching works, examination works are leading to stress, as they are under role ambiguity.

In 2016, during the teacher workload survey many teachers and academicians expressed the factors leading to stress as score recording, preparing lesson plans, student psychological behaviour, long working hours are causing stress in their profession. Cooper (2018) examined through his qualitative research, that faculty are perceiving high stress levels because of high work load and the influencing attributes identified as working beyond the hours, no recognition, less salary, job insecurity. Sears (2000) identified overload and stress are perceived attributes.

Instructors Role and Stress : The imminent segment presents a deliberate survey of the writing on pressure, the different wellsprings of teacher's stress and how far the diverse jobs performed by the educators are influenced by pressure. Writing affirms that various elements have been utilized to comprehend the connection between two factors e.g., (Conley, 2000); (Gillespie et al., 2001) to give some examples. The current investigation attempts to examine the couple of them; Job pressure and intentions to leave stressed educators were accounted for as indicating withdrawal practices, for example, a pessimism toward work, absence of authoritative duty and aim to leave (Taris et al., 2001). The rate at which instructors leave the calling is altogether higher than the flight rate in different callings (Minarik, Thornton, and Perreault, 2003). In light of the high instructor weakening rates inside the initial five years

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of their vocation, this defenseless time is "an open door cost for the wellbeing of the showing calling" (National Council on Teacher Quality, 2008, p. 3). Belasco and Alutto (1972) noticed that "it is clear that if a given instructive association is to support itself after some time it must be worried about both the fascination and maintenance of educators and the dependable execution of their interrelated job exercises". Thus, Benson (1983) proposed that it is "basic for rehearsing school organization to look at cautiously factors (identified with bureaucratic) school association ... while trying to (both) improve instructor fulfillment and lessen educator turnover". According to (Beehr and Newman, 1978) two kinds of authoritatively important results may result from job pressure: for example decreased occupation execution and representative turnover from the association. Worker turnover shows up intelligently identified with the experience of job pressure "given the basic thought that distressing occupations are agonizing and there will be an inclination to need to escape from them" (Bheer, 1995).Jackson and Schuler's (1985) detailed in their meta-investigation that, Role stress (for example job uncertainty, job struggle, and job over-burden) and turnover aims were accounted for to have a powerless yet positive relationship between them. Investigates in which job stressors influence turnover expectations may hence give direction to the chairmen to diminish specific stressors that add to turnover goals, additionally to the degree that job stressors add to the authoritatively esteemed result of turnover aims, the point shows up basically significant with regards to current detailed instructor deficiencies in the U.S. (Beehr 1995; Koustelios and Kousteliou, 1998).

Objectives

The following are the objectives of the study

1. To investigate the Role Stress of Engineering College Faculty members
2. To find the Role Stress of Engineering College Faculty members with respect to Gender, Age, Education, Designation and Experience.

Research Methodology

In substantiating the above theory, the research was initiated. Pareek (1983) scale on role stress was preferred for the study, among the entire dimension only role overload, role ambiguity, and role conflict, were adopted for the study. The investigator amended the scale according to the convenience to the study area and as per the flexibility of sample.

The research was designed to examine factors overloading the faculty with the impact of demographics and later to determine the key perceived attributes of faculty overload. The questionnaire was designed on the basis of the demographics of faculty members such as gender, age, qualification, experience, designation, salary. Next the factors determined as overload for the faculty and perceived level of overload attributes were identified such as involving in non-administrative works, long working hours, less salary, job politics, lack of proactive communication, job insecurity, centralized decision making.

The scale used for the study is a five-point Likert scale. Interpretation and inference considered for the study are based of the scale. The validity and reliability of scale is 0.77 for level of faculty overload and 0.84 for perceived attributes of faculty overload. On whole the reliability of instrument is 0.81

The population of study retrieved from DOE of JNTU-Anatapur, are 2314 faulty working in engineering colleges. Among them 350 engineering faculty members were selected from 27 colleges by stratified random sampling procedure.

Results and Discussions

Table 1
Level of Role Stress of Engineering College Faculty Members

Dimensions of Role Stress	Number and Percentage of Faculty members		
	High Stress	Moderate Stress	Low Stress
Role Ambiguity	160 (45.71)	140 (40)	50 (14.29)
Role Conflict	153 (43.71)	147 (42)	50 (14.29)
Role overload	151 (43.14)	179 (51.14)	20 (5.71)
Occupational stress	26(7.42)	282 (80.57)	42(12.01)

The above table 1 shows that majority of the faculty members 160 (45.71%) and 153 (43.71%) have expressed high stress level in role ambiguity and role conflict. Whereas in the dimension overload majority of them have expressed moderate stress level. Over all occupational stress was measured with the help of mean scores of all items and it reveals that 26 (7.42%) respondents are facing high stress levels, 282 (80.57%) respondents are having moderate stress levels and only 42(12.01%) are reporting low stress levels.

Table 2
Role Stress of Engineering College Faculty Members with respect to gender, age, education, designation and experience.

Demographic Variable	Category	N	Role Ambiguity		Role Conflict		Role Overload	
			t/F	Sig.	t/F	Sig.	t/F	Sig.
Gender	Male	221	3.718	0.000*	1.916	0.056	5.220	0.000*
	Female	129						
Age	Less than 25 years	29	40.338	0.000*	13.36	0.000*	1.176	0.319
	26 to 35 years	183						
	36 to 45 years	105						
	Above 45 years	33						
Qualification	Graduate	24	29.413	0.000*	4.391	0.013*	0.121	0.886
	Post Graduate	248						
	Doctorate	78						
Designation	Professor	31	51.402	0.000*	14.56	0.000*	1.629	0.167
	Asso. Professor	98						
	Assistant Professor	221						
Marital Status	Single	153	2.948	0.033*	4.384	0.005*	3.906	0.009*
	Married	198						
Work Experience	Less than 3 years	56	34.738	0.000*	14.31	0.000*	0.585	0.674
	3 to 6 years	142						
	7 to 10 years	108						
	11 to 14 years	31						
	Above 14 years	13						
Salary	Below Rs.15,000	31						
	Rs.15,001 to 25,000	124	30.885	0.000*	10.96	0.000*	1.156	0.331
	Rs.25,001to 35,000	66						
	Rs.35,001to 45,000	76						
	Rs.45,001 to 55,000	37						
	Above Rs.55,000	16						

* Significant at 5% level

From the above analysis it is proved that statistically a significant difference exists between male and female respondents. Role overload and role ambiguity is being common among gender and role conflict is rising between genders. As there is no clarity in authority and the female responded that they are getting instructions from two ways, which may lead to role conflict. Another observation is that role overload is not varying for any age group, qualification, work experience and according to salary.

Conclusion

Calculated examinations on job pressure of Engineering College faculty in the present study may have various immediate and backhanded negative impacts over their family life, authoritative citizenship conduct, work execution including the affinity of goal to leave and low hierarchical duty. Further, research is required to develop new models, extending the existing ones, and test the precursors and results. The investigator recommends constructing a few rules, in blend with the genuine encounters to the educators who are instructing at various levels. This would be a stress reducers of the Faculty of Engineering Colleges in near future.

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QUALITY OF WORK LIFE IN RELATION TO JOB SATISFACTION: LITERATURE REVIEW

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ABSTRACT

The article revisits the previous researches on the quality of work-life in relation to job satisfaction. The researcher aims to critically analyse the literature about the two variables and their relationship with one another. The studies conducted between 2010 and 2020 in India and aboard were considered. It brings to the limelight the merits of the review as well as the research gaps for the benefits of the researchers who intend to research the area under consideration. The systematic methodology was employed to review the literature. Majority of the studies show a clear direction that a significant relationship exists between the variables. The research to find the most effective to reduce turnover did not come up with many studies.

Key words: *Quality of work life, job satisfaction, Review of literature*

Introduction

Reviewing the literature is an inscrutable prerequisite to any research. Since effective research is based on past knowledge, this step helps to eliminate the duplication of what has been done and provides useful hypotheses and helpful suggestions for significant investigation. For any specific research to occupy the place in the development of a discipline, the researcher must thoroughly familiar with both previous theory and research. To assure this familiarity a review of the research literature is done. It allows the researcher to know the amount of work done in the concerned area. The clarity of the problem is possible with a thorough understanding of the knowledge generated in the area of research. The review of the related literature provides some insight regarding strong points and limitation of the previous studies. It enables the investigator to improve investigation and to arrive at the proper perspective of the study. Employees are considered to be the soft assets and hidden value of a company. Employees are the stimulus energy in every successful organization and therefore organizations are concerned about developing their human resources to achieve competitive advantage in the market.

High job performance is not possible unless and until employees get a better quality of work-life at the workplace. Quality of work life is a vital resource that enhances job satisfaction of employees. In this regard, the quality of work-life has become an area of interest as a fundamental issue that fosters employee's satisfaction.

Quality of work-life

Quality of Work Life (QWL) can be defined as an extent to which an employee is satisfied with personal and working needs through participating in the workplace while achieving the goals of the organization. Quality of work life is a multidimensional construct. Feldman (1993) defined Quality Work-Life is the quality of the relationship between employees and the total working environment. Lau et al (2001) described QWL as the favourable working environment that supports and promotes satisfaction by providing employees with rewards, job security, and career growth opportunities. NaslSaraji and Dargahi (2006) identified QWL variables as fair pay and autonomy, job security, health and safety standards at work, reward systems, recognition of efforts, training and career advancement opportunities, participation in decision making, interesting and satisfying work, trust in senior management, the balance between the time spent at work and with family and friends, level of stress experienced at work, amount of work to be done, occupational health and safety at work. Mehdi Hosseini et al, (2010) noted form the research that fair pay, growth opportunities and continuing promotion improves staffs' performance which in turn increases QWL of employees. Normala and Daud (2010) variables were identified, which include the physical environment, growth and development, participation, supervision, social relevance, pay and benefits. Nitesh Sharma et al., (2013) used seven dimensions to measure the status of QWL in

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small scale industries like Good working environment, Chance of growth, Fair compensation, Job satisfaction, Employees motivation, Communication flow, Flexible or suitable working time.

Job satisfaction

Job satisfaction is an individual's attitude towards the job or it is even an individual's reaction to the job. Job satisfaction theories have a strong overlap with theories explaining human motivation. The most common and prominent theories in this area include Maslow's needs hierarchy theory (Maslow A.,1995); Herzberg's(Herzberg F,1966) motivator-hygiene theory; the Job Characteristics Model (Hackman J.R. & Oldham G.R,1975); and the dispositional approach(Judge T.A &Lanen R.J,2001). Job satisfaction implies that an employee feels safe in his position and that his efforts are acknowledged and the company is giving back as much as he is providing to the company. A research conducted by Nadiri H. and Tanova C in 2009 showed that job satisfaction not only increases the employees' commitment but also increases the competitiveness and leads to better performance. These factors are work environment; work itself, supervision, compensation and personal status (Lee C. and Way K. 2009).

Review methodology

The purpose behind the literature review is to collect and generate structure reference related to the research problem from research articles, books, journals and other reliable and valid sources of information which have published in recent past. Research articles were downloaded from the databases like Elsevier's Science Direct, Proquest, Sage, Research Gate, Semantic Scholar, Springer and Scopus. The top hospitality and tourism journals were reviewed, and relevant papers were searched using the keyword "job satisfaction and quality of work-life to search for articles. The paper reviewed moderately supported the current research work. For make it more precise and inclusive analysis was conducted on those articles which provides suitable answers to the following questions:

1. Does the research article depict the understanding of the quality of the concept of work-life and job satisfaction and their constructs?
2. Has the paper endeavoured to analyse the relationship between quality of work-life and job satisfaction?

Review literature: quality of work-life and job satisfaction

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Ni PutuRatna Sari, Komang GdeBendesa, Made Antara (2019) studied the Influence of Quality of Work Life on Employees' Performance with Job Satisfaction and Work Motivation as Intervening Variables in Star-Rated Hotels in Ubud Tourism Area of Bali. The determination of respondents used was by proportional stratified random sampling method with a sample size of 240. The data analysis method used is Structural Equation Modeling (SEM). The results showed that QWL had a positive and significant influence on job satisfaction and work motivation.

Tamunomiebi, MiebakaDagogo (2018)investigated Quality of Work Life and Employee Job Satisfaction in Deposit Money Banks in Port Harcourt, Rivers State. The study adopted a cross-sectional research design and used the questionnaire as the primary source of data collection. A sample of one hundred and eighty-eight (188) respondents was drawn from a population of three hundred and fifty-five (355) respondents across the seven selected Money Deposit Banks in Port Harcourt, Nigeria. Results revealed that there is a positive significant relationship between the quality of work-life and employee job satisfaction.

EffatJahanbani, et al (2018) studied Quality of Work Life and Job Satisfaction among Employees of Health Centers in Ahvaz, Iran. In the current descriptive-analytical study? 143 technical staff of health centres in East of Ahvaz were selected by the multistage random sampling method in 2015. They found a significant relationship between QWL and JS.

Lenin Selvanayagam B. Thiagarajan M. (2017) raised a question Does Quality of Work-Life have any influence on Job Satisfaction of Employees in Star Hotels in Tamilnadu?, This research was accomplished based on nature descriptive method and survey technique was used in the data collection field. A sample of 124 waiters was drawn through simple random sampling technique. The result showed that there is a significant correlation between Quality of Work Life and Job Satisfaction and components of Quality of Work Life can be a predictor of Job Satisfaction among employees of Star Hotels.

Alzalabani AH (2017)Studied on Perception of Quality of Work Life and Job Satisfaction: brought evidence

from Saudi Arabia. This study contributes to the understanding of the quality of work-life and job satisfaction in a significant area in Saudi Arabia, that is, among employees of organizations in Yanbu Industrial City.

Ramawickrama, J., H. H. D. N. P. Opatha, PushpaKumari, M.(2017) studied Quality of Work Life, Job Satisfaction, and the Facets of the Relationship between the Two Constructs. Four facets of the relationship between the two constructs were revealed: Job satisfaction is a dimension of QWL; job satisfaction not being a dimension of QWL; job satisfaction working as an antecedent of QWL, and finally job satisfaction being a consequence of QWL. Formulated synthesis is perceived as an original contribution to the concepts of QWL and job satisfaction.

Indah KusumaHayati (2016) Analysed Quality of Work-Life Implementation against Job Satisfaction and Commitment of the Employees in three areas, namely Hosbun, Bogor and Jakarta East. The results of the analysis indicate that the application of QWL hypothesis does not affect job satisfaction of employees. Application of QWL and job satisfaction is significantly influenced by employee commitment.

BaqerShiraziChooran, Mohammed Reza Azadehdel (2015) worked on Quality of Work-life and its role in Job Satisfaction of Organizational Managers of Alberz Insurance Company's branches in Iran. The sample size using Morgan table and 186 people were determined satisfactorily. Walton, Bar Quality of Work-life and Job Satisfaction were used to collect data. The result showed that there is a significant correlation between the quality of work-life and job satisfaction and components of quality of work-life can be a predictor of job satisfaction

Tanushree Phatnagar, HarvendarSoni (2015) studied the impact of the quality of work-life on Job Satisfaction of School Teachers of Udaipur City. A sample of 100 teachers from Govt. and Private schools had been selected as convenient sampling.

A five-point Likert model questionnaire had been used to collect data. The result showed that there is a significant relationship between QWL and Job Satisfaction.

FatiheKermansaravi, et al (2015) investigated the relationship between Quality of Work Life and Job Satisfaction of Faculty Members in Zahedan University of Medical Sciences. In this descriptive-analytic study, 202 faculty members responded. Result revealed a significant and positive correlation between job satisfaction of faculty members and their quality of work life.

Bayan Fatehi, Ismail Amini, Ali Karimi, BisotoonAzizi (2015) analysed the impact of Quality of Work Life on Job Satisfaction of Sports Teachers in the Department of Education in Urmia. The research method is descriptive – correlation. According to Morgan table, a sample of 225 individuals was obtained. To collect data Waltons' QWL Questionnaire and the Minnesota Job Satisfaction questionnaire were used. The result showed that there is a significant positive relationship between dimensions of QWL and Job Satisfaction of sports teachers in the Department of Education from Urmia.

Richard Chinomona, ManilallDhurup(2014) researched the influence of the quality of working life on employee job satisfaction, job commitment and tenure intention in the SME sector in Zimbabwe. Five hypotheses were posited and sample data of 282 were collected from Harare, Zimbabwe's biggest city, to empirically test these hypotheses. The results of this study showed that, in the SME context, quality of work-life positively and significantly influences employee job satisfaction, job commitment and consequently tenure intention.

HarvinderSoni, Yashwant Singh Rawal (2014) studied the impact of Quality of Work Life on Employee Satisfaction in the Hotel Industry. Findings show that the quality of work-life has a significant impact on employee satisfaction in the non-chain hotels. Also, it confirms that there is no significant difference in the satisfaction level of hotel employee concerning the quality of work-life in the chain and non-chain hotels.

Bhavani, M. Jagadeeshwaran (2014) studied Job Satisfaction and Quality of Work-life of Women Teachers in Higher Education. To solve the problem a sample of 289 women teachers had been selected through proportionate stratified random sampling technique. The result of the study shows that there is a significant positive correlation between job satisfaction and quality of work-life of women teachers in higher educational institutions comes under the University of Mysore.

Hassan, Golkar (2013) investigated the relationship between QWL and Job satisfaction of human resource

managers in Iran. The data were collected using Questionnaires mailed to human resource managers of 300 Iranian firms listed on the Stock Exchange of Iran. The results indicate that a positive relationship between the implicit form of ethics institutionalization and both lower-order and higher-order aspects of QWL.

Ayesha Tabassum. (2012) studied the interrelations between Quality of Work Life Dimensions and Faculty Member Job Satisfaction in the Private Universities of Bangladesh. High satisfaction was found among the female with regards to QWL when compared to male. Teaching experience of teachers with less than one year experience is more positive in their thought about their QWL and its related dimensions compared to an experienced teacher.

Stephen A., Dhanapal D. (2012) investigated the employee perspectives of Quality of Work Life and its Impact on Job Satisfaction in Small Scale Industrial Units. The sample consists of 317 units of various Small Scale Industrial units in Chennai, Coimbatore and Madurai cities in Tamil Nadu. The study reveals the important QWL factors and employees perception of variables in job satisfaction in three major cities of Tamilnadu. The study found out the influencing QWL factors on job satisfaction. The level of perception of employees on Job satisfaction is higher in Coimbatore than in Chennai and Madurai cities.

John R., John Manohar.S.(2010) studied the relationship between Quality of Work-life and Job Satisfaction of Workers in the Textile Industry. Qualitative data was collected using a questionnaire. Stratified random sampling technique was used to draw a sample of 300 workers. The analysis of variance revealed that the perception of QWL differs according to different levels of quality of work-life and time shift. The job satisfaction of workers was significantly higher than the worker at a high level than the middle and lower level of workers.

Conclusion

A decade of literature proof serves as a source of hypotheses for research studies in this area. It highlights the source from which the variables used in the studies relating to measuring the quality of work-life and job satisfaction have been obtained. Based on the existing literature, a conceptual model can arrive and research gap can be identified. Thus the review of studies will be contributed to the study area to gain an understanding about the study variables to be selected and about how to formulate the design of the study and how the relationship between variables can be hypothesized.

The literature review conducted on the quality of work-life and job satisfaction and it's caused has demonstrated how the quality of work-life influences job satisfaction of employees in various sectors. The research to find what measures are the most effective to reduce turnover did not come up with many results. Nevertheless, more and more researches are conducted to find solutions and provide companies with advice to reduce turnover and recruit professional employees and transform them into loyal employees that achieve their balance of life. These researches showed that quality of work-life and job satisfaction is important for employees to commit to the company and reduce the mental and physical stress at work and to the companies to achieve their profits.

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WHY GOD MADE TEACHERS

When God created teachers,
He gave us special friends
To help us understand His world
And truly comprehend
The beauty and the wonder
Of everything we see,
And become a better person
With each discovery.

When God created teachers,
He gave us special guides
To show us ways in which to grow
So we can all decide
How to live and how to do
What's right instead of wrong,
To lead us so that we can lead
And learn how to be strong.

Why God created teachers,
In His wisdom and His grace,
Was to help us learn to make our world
A better, wiser place.

- Kevin William Huff