KEY FINDINGS AND CONCLUSIONS

6.1 Key findings from student’s data:

Findings from analysis of the students’ data suggest that technology assisted blended learning enabled by access to accredited, enriching content in a networked environment supported by training in educational technologies facilitates creation of a simple, motivating, interactive and learner-centric environment.

The strategic objectives are enjoy learning, active learning, learning how to learn and collaborative learning. Binary logistic regression has been carried out on SPSS to find out the influence of attributes of SMILE on strategic objectives. The results demonstrate a significant influence of SMILE on the strategic objectives. All the attributes of SMILE have significant influence on “enjoy learning” as well as “active learning”. Interactive, learner-centric and collaborative environment helps in meeting “learning to learn” objective. Collaborative learning requires a simple motivating and interactive environment.

The binary logistic regression of the opinion of students was also carried out by considering the attributes of the “SMILE” namely “simple”, “motivating”, “interactive” and “learner centric” as dependent variables with key elements of strategy and strategic actions as independent variables. It has been found that the proposed strategic actions such as open access to educational portals with accredited and appropriate content, networking of
educational institutions, blended learning and training on technologies have significant influence in creating SMILE (simple, motivating, interactive and learner-centric environment).

6.2 Key findings from teacher’s data:

Teacher will be at the heart of transformation in learning to facilitate every student to enjoy learning and achieve his/her potential.

Students enjoy learning and learn with understanding, while teachers would be more innovative in a simple, motivating, interactive and collaborative environment. SMILE facilitates teachers to achieve the objectives such as making learning a joyful experience, active involvement of students in the learning process, enabling students to learn how to learn, learn to share and share to learn by learning together.

Technology assisted learning also helps teachers to find more time for interaction with students and find the whole experience satisfying and rewarding. Media rich accredited content with simulations and applets help them to be innovative and creative in teaching and thereby enjoy teaching. Collaboration helps teachers in being creative and innovative in teaching and thereby find their profession exciting and enriching. Benefits of SMILE include active learning, learning flexibility, collaborative learning and innovation in teaching.

Teachers agreed that the strategic actions proposed such as access to accredited educational portals, networking of schools, blended learning with flexibility in curriculum and assessment and training for familiarity and usage of educational technologies and tools helps them to create SMILE and achieve the strategic objectives.
There is need for reforms in curriculum and examination system with emphasis on student's learning with understanding. Common national curriculum with flexibility given to the teachers as well as students in the assessment of learning, selection of content, method of teaching and way of learning to suit the learner and the context.

Infrastructure and access to ICT should be improved by providing broad band internet with the associated computer hardware and software to every class room. Educational satellite programs should be made available with video lectures from subject matter experts to facilitate professional development of teachers. Technical support for the network infrastructure and training in educational technologies are required in every school.

Challenges in creating and sharing SMILE:

Access to ICT:

The schools are not having proper infrastructure such as computer hardware and software to implement e-Learning. So schools should find resources to augment the infrastructure and there by provide required educational and computing resources to create a collaborative networked learning environment. Schools need to build strategic alliances with other schools and industry to share the infrastructure, educational resources, such as content and best practices.

Management:

Teachers are burdened with administrative work, high student teacher ratio, and vast syllabus. There is a need for reforms in curriculum as well as examination system. More teachers should be recruited to improve the teacher student ratio. Management should
change working culture, structure and processes to reduce administrative burden of teachers. Teachers need to be recognized, rewarded and encouraged to improve the quality of education through innovation.

**Training and technical support:**

Schools are not having access to technical support to maintain the computer hardware, software, e-tools and communication network. Teachers are also not trained in new e-learning technologies and hence they are not able to effectively use the technology for the benefit of students and themselves. So training of teachers in e-learning technologies and new methods of teaching is required.

### 6.3 Summary of Key findings:

1. Simple, Motivating, Interactive and Learner-Centric environment (SMILE) create conditions for learning with understanding, in which students become active learners, enjoy learning, learn how to learn and learn together. Content, Technology, Access and Collaboration are the key factors in creating and sharing a simple motivating, interactive learner centric environment. Collaborating to share the SMILE extends learning opportunities to all and thereby disseminating knowledge to a large audience.

2. Content design and delivery, access to ICT and content, technology, collaboration are the key elements of the strategy to extend learning opportunities for all and help every student achieve his/her full potential by learning with understanding and enjoying the learning process.

3. Teacher will be at the heart of transformation in learning to facilitate every student to enjoy learning and achieve his/her full potential. Training of teachers on educational
technologies helps them in being innovative in teaching. e-learning initiatives will be successful only if teachers are fully involved and committed to the overall vision of e-Learning strategy and the use of ICT.

4. Development of quality content and e-Learning material, which support teachers, is essential for the success of the e-Learning initiative. Media rich, accredited content through electronic media and portals helps teachers to be innovative in teaching and provides learning flexibility to students. Open access to accredited, enriching, appropriate e-Learning material empowers learners with flexible study and enables them to learn how to learn.

5. Technology enabled blended learning enhances learning experience and facilitates collaborative learning. Broadcasting of video lectures of expert teachers through national programs such as Edusat helps in extending the reach of quality education to remote and rural areas.

6. Networking of schools enables schools to share educational resources, infrastructure and best practices in learning management, thereby helping them to offer quality education and extend learning opportunities for all through a shared learning environment.

7. Blended learning associated with reforms in curriculum and assessment helps schools to create a student-centered learning environment in which students enjoy learning and teachers enjoy teaching. Flexibility in curriculum and assessment facilitates teachers to be more creative in meeting diverse learner needs.
6.4 Key Benefits of SMILE Strategy:

Learning Flexibility:

Students find more ways to develop the skills they need to participate fully in a technology-rich knowledge society. They can spend more time learning in groups, working with other learners, being creative, learning through challenging, game-like activities and materials that adjust to the level and pace appropriate to them with clear personal goals. E-learning achieves economies of scale through wide access to digital resources and information systems, combined with quality through shared tools and resources.

Learner finds more ways to learn by learning at his own pace, at his convenience, seeking knowledge from varied sources including educational portals, teachers, and other students. Learner also finds more options to learn such as video lectures, discussion forums, tutoring, and virtual learning environments. Students can also learn by working on projects together as a team with collaborative e-learning.

E-learning can provide an individualized learning experience for all learners, including those who are disadvantaged, disabled, exceptionally gifted, have special curriculum or learning needs, or who are remote. Personalized information, advice, and guidance services help learners find the course they need, with seamless transition to the next stage of their learning, including online application or enrolment and an electronic portfolio of their learning to take with them.
Students will have more choice about where, when and how you study, making it easier for you to create your own mix between studying in a place with other learners, learning at home, and learning online. Students can store electronically everything related to their learning and achievements, course resources, assignments, research, and links for professional advice and support, which can be accessed from home, school and any other place where internet access is available.

Students take initiative, assume responsibility for their own learning, make decisions and choices about their learning. Students are excited, engaged, enthusiastic and empowered about their learning, dig more deeply into a topic and expand their interests, retain what they learn, make connections between different subject areas and other aspects of their life, gain confidence and improve social and collaborative skills.

Access to varied but accredited content from open source such as BBC and search engines such as Google offers students the flexibility to learn anytime, anywhere at his own pace, to suit his learning style and preferences. In this respect, learning will become increasingly 'student-centred'. Project-based learning will be absolutely central to this shift, as it is precisely this type of learning that allows students to 'be in charge'. To date, project-based learning offers the clearest indication of the future direction of curriculum. This is because in project-based learning, the curriculum tends to be implicit in students' learning. Project Based Learning accommodates different approaches to learning, makes content more meaningful, develop higher-order cognitive skills, life skills, technological skills and self-management skills.
New ways of Learning:

New technologies enable new ways of learning which blends traditional classroom learning with self directed as well as networked collaborative learning. The self directed online learning, project based learning, collaborative learning and learning by doing helps students to gain control over the learning process and construct knowledge which they find relevant and meaningful.

Explaining concepts to students through text and static images in a book can cause difficulties particularly when the concepts are dynamic. Online quizzes with worked out examples and solutions improve confidence and satisfaction. Simulations allow variables to be changed so that students can understand cause and effect and the need to control variables in any experiment. Science students need to both observe and undertake experiments themselves in order to understand the inaccuracy of results, and to develop the notions of experimentation including the need to keep all except one factor constant so as to observe the effects of increasing or decreasing one variable at a time. Computer simulations can augment and enhance the students' understanding of experimentation and stimulates creative thinking.

Through these media, students are able to observe experiments that are either too dangerous or too expensive to carry out themselves, that would take too long, or perhaps have ethical implications. However it is not to say that these should replace all practical work because simulations can reflect a simplified version of reality and mask the complexities of experimentation.
The new technologies shape the new learning and in turn will shape the new education system. The focus shifts from content to competency, from what is known to what use you can make of the information, from what teachers can teach to what learners can learn. We need the customizing capacity of the online medium that allows individuals to select and make knowledge, which is of interest and value to them – and others.

Learning to share and sharing to learn:

Access to education can be made affordable through provision of adequate accessibility and connectivity, development of reusable quality educational resources with open access, digitization of resource materials and collaboration between education institutions. High quality e-Learning and support materials developed for standard curriculum areas will provide a consistent and enhanced learning environment for students and teachers.

Learning grids with advanced distributed computer systems and broadband network facilitates affordable high quality learning through sharing of knowledge. National Archive of e-learning materials with engaging and motivating content in the form of learning modules will be helpful to teachers for use in their class rooms along with access to a range of online professional development short courses and resources. Schools can share their own online programs with the involvement of students and collaboration with other schools in similar projects. Shared resources including online libraries and educational portals help teachers to be more innovative. Databases and repositories can be made accessible to other users. All schools can share reusable learning objects developed by following common international standards and we can combine connectivity with learning resources to create a shared knowledge capital accessible to the whole of humankind.
The collaborative e-learning brings learners, teachers, specialist communities and experts together to share ideas and good practice, contributing to new knowledge and learning. Educational portals with open access, which extends learning opportunities to all. Collaborative online environments help students to learn from other students or groups of learners as well as tutors and develop the cognitive and social skills of communicating and collaborating.

Innovation in teaching and learning:

Teachers need to define and articulate the skills for their profession in the digital age through discussion and debate in the same way that they developed a framework for their students. E-learning offers a wide range of design tools to enable teachers and learners to be innovative, creative by explaining difficult concepts through animations and simulations. Through these tools one can share ideas or customise digital learning resources for their own use. E-learning can offer flexible learning on demand, anytime or anywhere, blending traditional and innovative methods to meet learners' needs on or off campus, at home and school. Flexible learning design packages would enable teachers in all sectors to build their own individual and collaborative learning activities around digital resources. This would help them engage in designing and discussing new kinds of pedagogy, which is essential if we are to succeed in innovating and transforming teaching and learning.

E-learning exploits interactive technologies and communication systems to improve the learning experience and extends the reach of the creative and innovative teaching. Students enjoy learning if teacher explains the subject matter through simple concepts and interesting facts related to social context of the learner. It can enable every learner to achieve his or her
potential, and builds an education system for a future learning society. Essentially, e-learning
improves the quality of learning through using interactive computers, online communications,
and information systems in ways that other teaching methods cannot match. Teaching with
the aid of multimedia presentations makes learning interesting and engaging.

Teachers can access the digital content available on line and modify or adapt the same in
innovative ways appropriate to the context and the learner to make learning enjoyable.
Students enjoy learning with a simple, easy to understand images, graphics, animations and
simulations. Inspiring learning environments will enable students to develop their critical
thinking and creativity and realize their full potential. SMILE is a coherent e-learning strategy,
which improves the learning experience, empowers learners and teachers, increases
motivation, retention and attainment of learners and improves the quality of teaching from
empowered and motivated teachers.

More than 90% students concurred with the need for benefits of the proposed strategy
such as learning flexibility, learning together, innovation in teaching to make learning
interesting and engaging, new ways of learning such as online learning, multimedia
presentations and interactive simulations.

More than 80% teachers concurred with the need for benefits of the proposed strategy
such as innovation in teaching to make learning enjoyable through simple concepts and
relating them to the social context, new ways of learning such as online learning, multimedia
presentations and interactive simulations, learning together and learning flexibility.
6.5 Strategic actions required to implement SMILE:

Educational institutions can empower teachers and learners by creating a learning environment supported by a strong and inclusive educational vision. The vision for education can be realized with the integration of ICT when teachers share the overall vision for learning and the associated strategies for the use of ICT. Teachers need to acquire the necessary skills to engage effectively with the technology, which can be achieved through training. Teachers are likely to support if they can see the benefits which technology can bring to the delivery and management of learning in their institutions.

The strategic actions proposed are aimed at development and sharing of national learning resources to help raise educational standards, help teachers to improve their ICT skills and become competent to teach using ICT within the curriculum.

Professional development of teachers is a clear priority and training of teachers will help India to contribute in a significant way to the global knowledge economy. Teachers will then be more creative and innovative in teaching and find their profession exciting, challenging, enriching and rewarding.

Networking of all types of educational institutions from primary, secondary, college and university sectors helps us to share the resources and best practices to meet the diverse learning needs of a knowledge community.

Development of learning software and digital repositories is essential along with the supporting ICT infrastructure to enable schools to offer quality education for all. Government
and the private sectors shall work together to improve students access to and use of ICT to be able effectively leverage technology for the benefit of all. Access to archive of e-learning materials, which are accredited by subject matter experts, empowers students as well as teachers.

Reforms in curriculum as well as examination system are required to create a student centered constructivist-learning environment. Blended learning offers learning flexibility and new ways of learning where in students can learn in a more interactive and collaborative environment. The blended learning environment integrates traditional classroom learning with e-learning to facilitate active learning and project based learning, in which students play a significant role in driving the project.

6.6 Conclusions:

Teacher is at the heart of the learning strategy and hence teachers’ commitment is essential for the successful implementation of the strategy. Teachers need to share the vision and drive the strategy to empower students and themselves. Technology should be used only as a means of enabling effective learning along with new paradigms of content design and delivery appropriate to the delivery medium. Technology should be integrated into the learning environment with a sound appreciation of how people learn and the how technology can be leveraged to enhance learning experiences. We need to understand learning processes and the impact of ICT on those processes, to create an effective, supportive learning environment that is Simple, Motivating, Interactive and Learner-centric.
Majority of the students and teachers agreed that a simple, motivating, interactive and learner centric environment helps them to enjoy learning and learn with understanding. Simple, Motivating, Interactive, Learner-centric environment (SMILE) creates conditions for learning in which every student enjoys learning, learn to learn and learn to share with others there by providing learning opportunities for all. We need to create and share the SMILE to facilitate every student to learn with smile and achieve his/her full potential by learning how to learn to actively pursue life long learning.

SMILE shall provide access to accredited, appropriate and affordable content in a collaborative networked learning environment. Sharing the SMILE facilitates students communicate extensively with their peers and teachers and develop a community of learners who share their knowledge, there by extending learning opportunities to all. Open access to national archive of engaging and accredited e-learning content through educational portals, connecting schools into a collaborative networked environment to share best practices and educational resources, reforms in curriculum and assessment aligned with student centered learning, center for excellence in educational technologies for professional development of teachers are strategic actions to be pursued to create and share the SMILE. Share the SMILE to learn with smile sums up the strategy to create an environment in which learning is a joyful experience by collaborating to create and share the knowledge.

6.7 Implications of the study:

The findings of the study reveal that a simple, motivating, interactive and learner centric environment helps students enjoy learning and learn with understanding. Simple, Motivating, Interactive, Learner-centric environment (SMILE) creates conditions for learning in which
every student enjoys learning, learn to learn and learn to share with others there by providing learning opportunities for all. We need to create and share the SMILE to facilitate every student to learn with smile and achieve his/her full potential by learning how to learn to actively pursue life long learning.

Schools, Educationists, Government and Industry should collaborate to build a national learning grid for schools where in quality learning environment is extended to every child at affordable costs Teachers should be rewarded and recognized for their contribution so that teaching as a profession is considered challenging and rewarding. Professional development of teachers through training in educational technologies should be pursued through a national level institute for excellence in education.

Schools and Government should take initiatives to:

**Enrich:** Learners with open access to accredited, appropriate, enriching educational resources designed to address mass customization in a networked environment shared by learning communities.

**Enable:** Access to a shared learning environment, which is simple, motivating, interactive and learner- centric by leveraging information and communication technologies and develop capabilities of teachers as well as students through training in educational technologies.

**Empower:** Students and teachers to collaborate, to innovate and to transform the learning and teaching in innovative ways to acquire, disseminate and create knowledge to shape the future of the knowledge age by creating and sharing the SMILE.
6.8 Contributions:

The contributions of this study are as follows:

1. The importance of networked learning environment in offering stress free, student centered education, which enables students to enjoy learning and learn how to learn for pursuing life long learning has been established.

2. The study established that a Simple, Motivating, Interactive, Learner centric environment integrates the learning theories and models proposed by researchers belonging to constructivist, cognitive, experiential and motivational schools with technology assisted learning.

3. The study also proved that sharing the knowledge through a networked learning environment empowers both learners as well as teachers and extends learning opportunities to all students who are having access to network.

4. Teachers form the heart of the strategy to lead the transformation and hence we need to recognize and reward teachers. The importance of professional development of teachers has been established which highlights the need to create opportunities for teachers to learn e-learning tools and technologies and assist them by providing access to enriching content. The strategic actions proposed helps teachers to be more creative and innovative and there by find their profession exciting, challenging and rewarding.

5. Strategic actions proposed in this study can be initiated and implemented by schools with support from government and industry. Strategy proposed is simple, scalable and flexible. Strategy also creates value to every stakeholder by leveraging technology and principles of aggregation assembly, rewiring and orchestration in a networked
environment. This study provides a useful framework for e-learning initiatives by schools as well as government.

6.9 Limitations of the study:

The limitations of this study are:

1. The study has been limited to schools in Hyderabad only; so the restricted geographical region is a limitation for this study.

2. The study has been limited to secondary education.

3. Survey method employing self-reporting subjective measures by way of questionnaires have been used and no objective measures have been incorporated in the research methodology due to constraint of resources.

4. This study does not cover strategy implementation aspects such as resources, infrastructure leadership, communication, funding, policies, systems and processes, educational management benefits of ICT and the associated costs.

5. This study has not considered the effect of culture, native languages and the socio-economic background of the students.

6. This study has not considered the special requirements of disadvantaged children who are physically challenged.

6.10 Scope for further research:

This strategy and the strategic actions proposed in this study can also be used to with appropriate changes by other educational institutions as well as learning organizations in the industry. The future researches can be conducted in colleges and universities, also to study
the usefulness of this strategy for higher education. Further research can also be conducted to evolve a unified strategy for all educational institutions. Research can be conducted to verify the usefulness of this strategy for disadvantaged children and education in native languages. Research can also be extended to verify the usefulness of this strategy in rural areas, which are not having broadband connectivity and study the effectiveness of initiatives such as Edusat.