

Trends in Studies Related to the use of Future Gadgets in Education

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Abstract— The 21 century is century of the new technologies with the humanity creation we are capable of creating a lot of new things which changed our life. It was our perception that made us to think 10 years ago, we hardly could believe we would have mobile phones, modern personal computers, notebooks, international net without which we cannot image our life. Now, they have become a part of life. If we are looking back in time, we realize how much our lives have changed due to the fruits of technology. Also, the nation's economic growth can be measured only according to the level of technology and innovations in every sphere, whether it is social, economic, political, medical, military, commercial, transport, telecommunications, banking, education etc." In fact, it is the educational technology brings super power in the field of education which proves to be a boon for the research purposes, especially for Indian education system that needs to be more development in terms of modern instructional technologies related to the field of education. Innovative aspect of education is a trend of everyday the new concepts, research outcomes, ideas, improved teaching-learning process, advanced technology that emerge worldwide which are to be explored and exposed for updating the knowledge. Here, the few researches are discussed briefly based on the past research work related to futurology, instructional technology using future gadgets in education, and some innovative trends in teaching-learning process, conducted both in India and abroad with respect to conceptual, methodology and findings are discussed below.

Key words: Future Gadgets, future gadgets in education

I. CONCEPTUAL ISSUES

Anuradha, Vashisth. (2014) focused on the Future Language Classroom, as independent variables and technology-based instructions like to both direct instruction (traditional approach) and incidental learning (technology-based approach) for vocabulary acquisition as the dependent variable. Few of the researches from west, Fredy Yesid Mesa Jimenez (2012), developed foresight to map alternative futures towards the evolution and futurology concerning ICT in Colombian universities over the period from (1957-2010). Also, Saima Rasul, Qadir Bukhsh and Muzamilla Akram (2010), focused on the futurology of higher education considering relationship between some personal variables as gender, subject, institution, science/social sciences; dependent variables as attitudes, perceptions of student-teacher's regarding future perspectives of higher education; by considering the futurology of higher education and science/social science degree (qualifications) as independent variables. Harri Ketamo, Timo Teimonen, Kaius Thiel and Vesa Koivisto (2014), appropriately discussed the technical backgrounds on edu elements game development project for elementary/primary school using variables such as grade-education, assessments, etc.

Even if with some exceptions from few European countries such as Helsinki, Finland, Alicante, and Spain, the literature review conducted about social innovations revealed how innovations in social services is strictly connected with (and often encompassed within) the social innovation such as Guillo Mario (2014). Further support for matching technological innovations to self-efficacy using Technology Acceptance Model (TAM), innovativeness, and iPad2 self-efficacy (ISE) and the education through IPAD creativity in solid geometry about the usage of IPAD such as HD video, e-learning in Taiwan, conducted by Jon-Chao, Hong., Ming-Yueh, Hwang., Tzu-Yun, Ting., Kai-Hsin, Tai., and Chih-Chin, Lee. (2013); and Nelson, Liu. (2013); respectively. The studies emphasized on studying the relationship between the variables about perceptions of students and Technology Acceptance Model (TAM), innovativeness, and iPad2 self-efficacy (ISE). Andrew, P. Jaciw., Megan, Toby., and Boya, Ma. (2012) explored the relationship between the variables, dependent variables as the student's achievements in algebra as dependent variables and the usage of tablet-based applications such as to manipulate variables, note-taking features, color code for organization, pre-programmed quizzes test, test specific skills before begins a chapter, view-in motion explanations or videos that address concepts from a different approach as dependent variables and the levels of motivation for learning as independent variables. Arumugam, Raman. (2011) has focused about the usage of technology among students using TAM (Technology Acceptance Model) to explore real and extended technology-rich outcomes-focused technology at university level considering various variables such as gender, qualifications, TAM learning, computer based technology learning, ease of perceived use.

Few studies were undertaken to promote technological, technical, and visual literacy using virtual and physical modeling among students at national level. Jeremy. V. Emst and Aaron C. Clark, (2009), who explored the relationship between (dependent variables) as the attitudes of students towards visual/aural/kinesthetic/reading-writing learning styles on various 2D illustrations, 3D models, animations and 2D graphic applications; and the technology-based content (independent variables); and gender, education, subjects such as science and technology (personal variables). Whereas, Joe, W. Kotrlik. and Donna, H. Redmann. (2009), have focused on learning through instructional technology among secondary teachers such as GPS, e-mail, videocassette, CD or DVD recorder, digital video camera, PDA, and the technology accommodation in classroom or laboratory. The background variables considered as educational level, school and how these variables affect the adoption of technology-based education among secondary teachers. Whereas, the (dependent variables as) various instructional technology such as GPS, videocassette, CD or DVD recorder, digital video camera, PDA and use of technology other learning tool in classroom

or laboratory, technology-based games or simulations on a regular basis in classrooms or laboratories and the educational degrees (qualification) were considered as independent variables.

In context of the technology-based learning, Sharma. (2014), Vikram. (2014), Jagannath (2013), Sushma, Rani. (2013) etc. have focused on the effectiveness of ICT (web-browsing, emails, mobile phones, LCD/PPT internet, CDROM, EDUSAT), CAI, PLM and MMLP multimedia education towards attitudes of students (teacher education) in various subjects such as Arithmetic, Computer education, Mathematics, Science education etc. with respect to various variables such as gender, age, educational level, type of institution, and attitude, achievement of students in terms of intelligence and socio-economic as covariates. Similarly, in the studies from western reviews Haroon, Sseguya., Robert, Mazur., Eric, Abbott., and Frank, Matsiko. (2012), Consolata Angello and Evans Wema (2010), Ragassa. (2008) etc. promoted the usage of ICT, CAI-based learning and electronic resources of information, on various subjects such as Mathematics BSI, Language, Statistics, and other domain areas such as agriculture and rural education by considering variables such as infrastructures, network availability, organizations, type of institution, achievement, learning outcomes and other demographic variables gender, age, qualification, education, grade etc.

In west, Achmad, Nizar. Hidayanto., and Steela, Tantra. Setyada. (2014); and Janice, Waldron (2012) focused on studies related in the context of collaborative tools such as multimedia and ICT tools such as e-mail, Google Drive, instant messaging, Whatsapp, Kakaotalk and Line, Skype and Dropbox, weblogs, Youtube, Fanvids, Vlogs, and blogs in the field of education such as Skype, written narrative texts- forums post, email, chat room conversations, hyperlinks to YouTube and other internet music learning resources by considering gender, qualification, education etc as background variables. The study related to the web-based communication skill training framework (FILTWAM) in which, Kiavash Bahreini, Rob Nadolski, Wen Qi and Wim Westra (2014) made use of multimodel framework using online web-based communication skills training framework (FILTWAM) for improving online communications of the lifelong learners and webcams-microphones for enhancing learning support. Furthermore, Floyd, Lewis., Graham, Pervan., and Vincent, Lai. (2014), provided an overview of selected correlational and experiemental stuides concerned with the educational organizations e-collaborative activities included "communications, information and knowledge sharing, decision-making, report writing/information pooling, monitoring, discussions and brainstorming". In the same context, Xiangyu Wang, Peter E.D. Love, Robert Klinc, Mi Jeong Kim and Peter Rex Davis. (2012), have focussed on Web 2.0 learning by using learning skills such as conventional e-learning styles, Web 2.0 environments included e-learning, Web 2.0 technologies, 3-D visualizations, 3-D graphical based tools, 3-D virtual environments, E-learning 2.0 skills, social learning skills, and the conventional learning as independent variables; and the attitudes among students of Deakin University and the Chinese university of Hongkong towards various learning styles were dependent variables.

Jeremie, Seror. (2013), focused on the student's abilities to learn new through different instructional materials based on to produce powerful real-time visual records of the multiple events involving writing in digital spaces by using Screen Capture technology method of study as an independent variables and the perceptions of students towards processing technologies as dependent variables. R. Sourecha., and A. Selvan. (2013), have focused about efficacy of smart board in teaching-learning process on disaster management at high school level using interactive Smartboard mediated learning that included the package included texts, pictures and animated videos of the preparedness for the various types of natural disasters.

Clarisa, Hughes., Ann, M. Roche., Petra, Bywood., and Allan Trifonof. (2012), have made use of 'Audience-Response Devices' ('Clickers') to contribute to alcohol education in schools. The learning variables were categorized into four components by factor analysis, included interactivity, peer education, obtaining student's opinion/knowledge and highlighting misperceptions using 'teachable moments' and provide potential to enhance delivery of evidence-based alcohol education to the students. Some research studies were based on the operand condition model including 3 Avatar by creating virtual environment such as in the research of Colin, Lemmon., Siu, Man. Lul., David, Cottrell., and John, Hamilton. (2014), have conducted about student's understanding of scientific methods to develop an interactive 3D virtual world.

The most glaring proof of the need to study and facilitate the design of teaching approaches and orientations in the field of educational research is to explore the educational perspectives of XBOX kinect based video games that supports various developmental axes evident in the review literature of Kandroudi, Marina., and Bratitsis, Tharrenos(2014). Margaret Horna and Emine M. Thompson (2007), have focussed on virtual reality (VR) and 3-D modelling in built environment education using various variables such as virtual reality, BIM (Building Information Modeling), 3-D modelling and VR (Virtual reality) modules of teaching as independent variables; attitudes, perceptions, opinions and concerns of academic staff in regard to use of 3D and VR technologies as dependent variables; and institution, academic experience as background variables.

The researches regarding the use digital technology towards Pre-service teacher's motivation were seen in the study of Alexander, S. Yeung., Eng, Guan. Tay., Chenri, Hui., Jane, Huiling. Lin., and Ee-Ling, Low. (2014). The study considered Pre-service teacher's motivation and post-graduate/degree programs (qualifications) as independent variables; the usage of digital technology as dependent variables; and the personal variables as gender, age, education.

Mark, Pegrum., Christine, Howitt., and Michelle, Stripe. (2013), have conducted a study regarding the perceptions of pre-service teachers towards a new sense of learning spaces using iPads including 3G/4G-enabled iPads to learn seamlessly across formal and informal contexts and accessing the support of their personal learning networks, on perceptions of pre-service teachers towards using iPads, considered iPad learning skills and qualification degrees as the independent variables.

Teacher's adoption of technology and their effectiveness on achievement and technology usage were widely explored in the research study of Robert Aldunate and Miguel Nussbaum (2013), to study the interplay between teacher technology adoption behavior and types of technology, where teacher's adoption of technology as independent variable; and effectiveness of technology teacher's behavior as dependent variable and usage of technology such as using electronic whiteboards, digital cameras, and websites as dependent variables. Marie-Annie Mundy, Lori Kupczynski and Rick Kee (2012); and Abdurrahman Ghaleb Almekhlafi and Farouq Ahmad Almeqdadi (2010), have investigated the perceptions of teacher's towards the use of technology in the schools using Dot! USA Teach up programs.

Some studies were undertaken to see the holistic view of teacher's perception about M-learning, H.Uzunboylu., and F. Ozdamli. (2011), have focused on various developmental scales, for exploring the relationship between various variables gender, branches, as personal variables; "Forms of M-Learning" (FMA) and "Tools Adequacy of Communication" (TSAC) as the independent variables; and attitudes of teachers towards M-learning as dependent variables.

Efforts have been made in India towards studying the scope of e-learning using e-resources and e-journals in e-libraries. Mukesh, Saikia. And Anjan, Gohain. (2013), have analyzed the experiments done on library e-resources achieved greater gains in terms of accessing to e-journals, periodicals, online renewals of books, OPAC/Web, PAC, e-resource retrievals, book bank facilities in order to improve its performance.

II. METHODOLOGICAL CONTEXTUALIZATION

Fredy Yesid Mesa Jimenez (2012), used historical research method. Saima Rasul, Qadir Bukhsh and Muzamilla Akram (2010), used statistical tools like SUM, MEAN, and percentage method (%) with the help of Microsoft Excel and Chi-Square test to analyze the data on various educational levels. Joshua Mutambi, Joseph K. Byaruhanga, Lena Trozer and Peter Okidi -Lating (2014), used CSPRO software, STATA statistical software, and statistical techniques such as percentage (%) method. Also tools used by the Guillo Mario (2014), were of mixed method descriptive research including t-test, ANOVA and Chi-Square test for the analysis and interpretation of the data. The research instruments used were the Likert's scale, individual innovativeness scale. Jon-Chao, Hong., Ming-Yueh, Hwang., Tzu-Yun, Ting., Kai-Hsin, Tai., and Chih-Chin, Lee. (2013) used Visual PLS 1.40 software to perform reliability analysis, factor analysis, structural equation modeling (SEM) and other research tests. The statistical techniques used were Mean, SD, t-test, Cronbach's α values and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Arumugam, Raman. (2011) applied statistical technique such as Moderated Multiple Regression (MMR), regression analysis, frequency histograms and simple percentage methods were used were used to find out the relationship between dependent and independent variables. Also, the instrument used for the study conducted by Jeremy. V. Emst and Aaron C. Clark, (2009), consisted of 20 multiple choice questions with Mental Rotation Test,

visual, aural, read/write and kinesthetic (VARK) questionnaire. Joe, W. Kotrlík. and Donna, H. Redmann. (2009), used inferential Mean, S.D., t-tests, multiple regression analysis and Levene's test for scale equality of variances were used to compare the scale means of the technology adoption, barriers, to technology integration, and technology anxiety scales for those responses received during the phone.

The reviews from the west such as Haroon, Sseguya., Robert, Mazur., Eric, Abbott., and Frank, Matsiko. (2012), have used NVIVO software and percentage method for data-analysis. Carmelita, Y. Ragassa. (2008) has used the quasi-experimental, non-equivalent control group design. The study used SPSS 11.5 to compute for the MANCOVA.

Achmad, Nizar. Hidayanto., and Steela, Tantra. Setyada. (2014), followed the descriptive research method using a questionnaire tool for both online and offline mode. The Chi-Square test, LISREL tool for covariance Structural Equation Modeling (SEM), Root Mean Square of Approximation (RMSA), Standardised Root Mean Square Residual (SRMSR), t-test and percentage method was effectively used as a statistical tool for the study. Floyd, Lewis., Graham, Pervan., and Vincent, Lai. (2014), have used questionnaire, surveys, telephonic interviews, and semi-structured questions. The statistical technique t-test, F-ratio, percentage method, Kendall's coefficient of concordance (W), and frequency histograms were used for the data analysis and interpretations. Xiangyu Wang, Peter E.D. Love, Robert Klinc, Mi Jeong Kim and Peter Rex Davis. (2012), have adopted qualitative research method including various CAD programs, VR-based structural analysis program (VSAP), and build interactive modeling (BIM). The percentage method and pre-test, post-test were used by the researcher. While, Roelien, Brink., and Geoffrey, Lautenbach. (2011), have effectively the qualitative analysis consisted of questionnaires using four-point Likert's scale and interviews recorded as audio files on CDROMS. The SPSS, Mean, SD, Variance and factor analysis were used as statistical techniques.

Ahmad, Abu-Al-Aish., and Steve, Love. (2010); and Chung, Kuo. (2007), used exploratory factor analyses using SPSS 16 software and the various statistical techniques such as percentage method, cumulative percentage, frequency distributions, Chi-Square values, t-values, the Cronbach's alpha values, correlation matrix and square multiple correlation. R. Sourecha., and A. Selvan. (2013), have used the Cabri3D computer software, as an interface that allows teachers and students to get quickly concentrate on teaching mathematics, not on software. Colin, Lemmon., Siu, Man. Lul., David, Cottrell., and John, Hamilton. (2014), have adopted the behavior matrix and reinforcement matrix which, included random behavior weighted by behavioural probability matrix. The polygonal zoning behavior included the travel required for location specific behavior or the behaviour assigned to zones or locations. Margaret Horna and Emine M. Thompson (2007), have employed both qualitative and quantitative data analysis including 3-D modeling and VR software. A total of 11 semi-structured interviews were conducted using one hour audio taped facility to facilitate the data analysis. Robert Aldunate and Miguel Nussbaum (2013), have used

simple random sampling with Karl-Pearson's Product moment correlation and percentage method for the research study.

III. FINDINGS

Anuradha, Vashisth. (2014) found relationship, as with the use of technology for orchestrating the future language classroom, the majority of the students were capable of performing at higher intellectual level using simulated thinking and the tech-based learning resulted in improved readiness, interest and confidence among students for better learning outcomes. Similarly, Fredy Yesid Mesa Jimenez (2012), found the incorporation of ICT applications like Web 2.0, Whiteboard technologies, digital smart classrooms to be effective in various countries such as Spain, Mexico, U.K. and in Latin America. The study of Fredy Yesid Mesa Jimenez (2012), resulting persistence significant differences related to various educational services. Saima Rasul, Qadir Bukhsh and Muzamilla Akram (2010), found that there was no significant difference in the level of agreement/disagreement with respect to gender, science faculties and subject teachers such as science/social science teachers about future perspectives of higher education in Pakistan.

Guillo Mario (2014), found that the PEST (Political, economic, social and technological) analysis revealed significant difference among relationship between the various variables gender, education, institutions (institutional and private sectors) and other variables as global, national and personal variables. Similarly, Jon-Chao, Hong., Ming-Yueh, Hwang., Tzu-Yun, Ting., Kai-Hsin, Tai., and Chih-Chin, Lee. (2013) found that there was a significant positive influence on each participant's perceives usefulness (PU), user satisfaction and perceived ease of use (PEU), regarding innovativeness and iPad self-efficacy especially using iPad2.

Andrew, P. Jaciw., Megan, Toby., and Boya, Ma. (2012), found regarding the conditions for the effective use of a Tablet-Based Algebra Program, an application of Apple iPad. The applications provided variety of interactive tools that allow students to manipulate variables, note-taking features, allow students to type in notes, color code for organization, record messages, vocabulary word, pre-programmed quizzes test, test specific skills before begins a chapter, calculations, writing notes, view-in motion explanations or videos that address concepts from a different approach.

Jeremy. V. Emst and Aaron C. Clark, (2009), research study resulted that through the use of visualization in technological education program, students showed a high degree of spatial visualization enhancement with respect to certain variables such as gender, learning styles, attitudes of students towards visual/aural/kinesthetic/reading-writing learning styles on various 2D illustrations, 3D models, animations and 2D graphic applications, technology-based content, education, and subjects such as science and technology. Joe, W., Kotrlik. and Donna, H. Redmann. (2009), found relationship as learning output increased due to the use of instructional devices such as email, computer with an internet connection, videocassette, CD or DVD recorder, digital video camera, GPS, or PDA in education. While, Hemant, Lata. Sharma., and Sunita, Sharma. (2014),

Rewant (2014), Angel, Rathnabai. (2013), Dange (2013), Sushma, Rani (2013), etc. have found that the CAI, ICT (Internet, CDROM, EDUSAT), CAI, PLM and MMLP multimedia education towards attitudes and achievements of students in various subjects such as Arithmetic, Computer education, Mathematics, Matrix Algebra, Science education etc. found to be significantly effective than the conventional classroom learning instruction with respect to various variables such as gender, age, educational level, type of institution, and attitude, achievement in terms of intelligence and socio-economic as covariates.

With reference to studies based on internet usages Manoj. Kumar. Saxena, Jyotsna Saxena., and Sandhya, Ginal. (2009), have found that the overall awareness of internet among students was not up-to-the mark, as a large number of respondents were still not aware of the various uses of internet. The male respondents have better internet knowledge as compared to the internet usage among female's candidates. Also, qualification-wise, it was found that the undergraduate students tend to use the internet more for recreational purposes and post-graduate students being more research inclined tend to use internet for a variety of reasons like data collection, obtaining study material, e-mail etc.

Achmad, Nizar. Hidayanto., and Steela, Tantra. Setyada. (2014), found that by the effective use of collaborative tools such as e-mail, Google Drive, instant messaging, Whatsapp, Kakaotalk and Line, Skype and Dropbox, had showed a positive influence on the student's team performance with respect to gender, education, and qualification wise.

Based on the studies related to the framework FILTWAM online game based communications-skill using webcams and microphones, Kiavash Bahreini, Rob Nadolski, Wen Qi and Wim Westra (2014), have found that FILTWAM offered communication skills for lifelong learners and a new version of software for face emotion recognition, may be developed appropriately.

Xiangyu Wang, Peter E.D. Love, Robert Klinc, Mi Jeong Kim and Peter Rex Davis. (2012), have significantly found that the students using Web 2.0 demonstrate capable of have better learning that can be transferred to real work task in most cases and in some cases even generalize to other untrained tasks. It was hence concluded as evolution from e-learning 1.0 (Web 1.0 based) to e-learning 2.0 (Web 2.0 based) requires not only a technological shift, but also a conceptual change in all stakeholders.

Ahmad, Abu-Al-Aish., and Steve, Love. (2010); and Chung, Kuo. (2007), found the relation as with the use of M-learning system, the students with high performance expectancy (who believe that using an M-learning system will be beneficial to them in their studies) have a tendency to accept M-learning rather students with lower performance expectancies. The M-learning system will be easy to use and it was found expectancy was the strongest predictor of behavioral intention to use M-learning. Jeremie, Seror. (2013), has revealed that insight possible through the use of screen capture technology, its applications in L2 writing processes and strategies, and in producing powerful real-time visual records of the multiple events involved, for better student's digital learning outcomes and the associated tools such as online dictionaries, task descriptions, spell

checkers, online forums etc. R. Sourecha., and A. Selvan. (2013) resulted that the students subjected to interactive Smartboard mediated learning (the package included texts, pictures and animated videos) showed greater enhancement in the student's knowledge in understanding the natural disaster concepts and preparedness versus that of the control group student's. Nelson, Liu. (2013), has found that the iPad usage is positively correlated with the student's achievement gain in solid geometry teaching but it is negatively correlated with the student's achievement gain on measure of performance when experiencing the different instructional environment.

Clarisa, Hughes., Ann, M. Roche., Petra, Bywood., and Allan Trifonof. (2012), have revealed that the use of Clickers (Audio Response System) to correct misperceptions of alcohol education supports open-up discussion, encourages the quieter majority to speak up and provides feedback to overcome saliency and credibility issues exhibited by many existing social norms interventions. Thus, these technologies hold considerably promise for engaging adolescents in research projects, school-based health education, and other curriculum/school activities and programmes. Colin, Lemmon., Siu, Man. Lul., David, Cottrell., and John, Hamilton. (2014), have found that the safe virtual environment was created with an interactive 3D world free from supervisor or ethical considerations, by engaging the students with the entire experimental process including experimental design administration of methodologies, data collection, analysis and reporting.

Kandroudi, Marina., and Bratisis, Tharrenos(2014), found that the using X-BOX Kinect games in early childhood and primary education, in various lessons and themes, related to particular subject based on physical movement, kinesthetic activities, emotional skills, and developmental mechanism including mental skills helped to facilitate the design of teaching approaches and teacher orientation in the educational research. Margaret Horna and Emine M. Thompson (2007), sought to investigate the effects of virtual reality and 3-D computer modeling on learning and teaching in a school of the built environment. As the benefits of visualization technologies such as virtual reality and 3-D modeling are varied but were seen as having the potential to improve and extend the learning process, thereby increase student motivation and awareness which add to diversity of the teaching methods.

Alexander, S. Yeung., Eng, Guan. Tay., Chenri, Hui., Jane, Huiling. Lin., and Ee-Ling, Low. (2014), have found that the learning goals had relatively stronger relations than performance goals with both personal use and classroom application of DT (digital technology) towards Pre-service teacher's motivation in gender differences, usages, age etc. But it was further found that the younger teachers and female teachers had higher performance goals than the older teachers and the male teachers respectively.

Mark, Pegrum., Christine, Howitt., and Michelle, Stripe. (2013), found that the use of 3G/4G-enabled iPads supported multiple learning in a pedagogically appropriate manner both formally or informally way, including engaging in higher level of reflection and supported personal learning networks.

Robert Aldunate and Miguel Nussbaum (2013), have found to have significantly greater impact on the opinion of teacher's through the use of electronic boards, educational web, digital cameras etc. devices towards teacher's adoption of technology.

From the Indian studies towards e-learning and e-technology, Mukesh, Saikia. and Anjan, Gohain. (2013), have focused on the various e-services and e-resources in order to improve its performance such as access to e-journals, periodicals, online renewals of books, OPAC/Web considered PAC, reprographic services, current journals, training and demo on e-resource retrievals and reference and information services, mobile alert services, book bank facilities, e-news services, current awareness services of newly acquired books.

IV. CONCLUSIONS

Research studies related to the use of future gadgets in education in this trend report show variety in design and thrust, as shown in the fig. no.1. The larger proportion of the researches are related to the educational technology, ICT, CAI, future gadgets like 3G/3G enabled I-Pads, Mobile Phone devices, Clickers, X-BOX, webcams-microphones, 2D/3D Animations, 3D virtual environments, interactive smartboards, electronic-boards, digital cameras, DT (Digital Technology), screen capture technology, web-based tools and devices, etc. However, there has been studies on the other areas like effectiveness of information technology in library sciences related to the use of electronic journals, ICT adoption in libraries and OPAC/Web, PAC, e-resource retrievals etc. Most of the studies have been on the comparative study of internet, ICT, CAI, ODL, TLM's etc. What is needed as new thrust areas in research are: the effectiveness of technology in virtual classroom, virtual teaching, video conferencing and through the use of future gadgets in teaching-learning process.

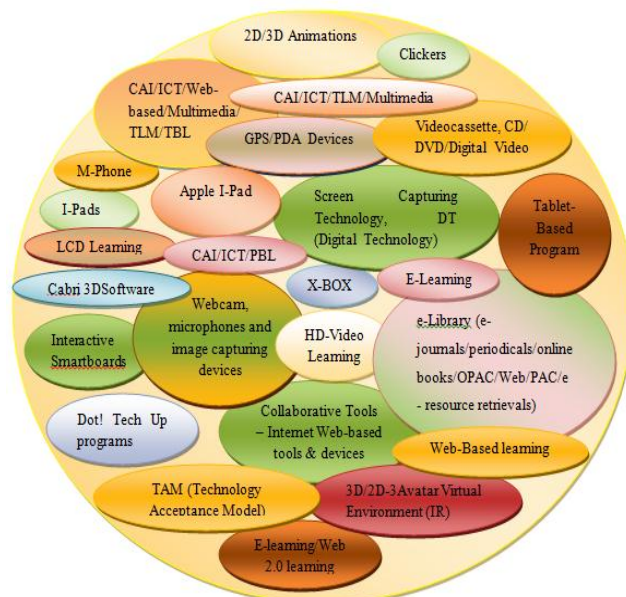


Fig. 1: Trends in Studies related to the Use of Future Gadgets in Education.

An analysis of these prior investigations has been of use to the present research in more than one way. A review of prior researchers has helped the present researcher to determine the scope of this study in terms of important

variables to be included in the study. Very few of the prior researches have included study about future gadgets and its comparison of students, teachers, administrators, gadget experts, educationists, parents and other stakeholder's perceptions on the basis of the categorization, utilization, barriers and preparatory needs especially in the Indian context.

The fig. no.-2 shows the Pie-representation of the conceptual overview for the trends in studies related to the use of future gadgets in education. From the graph, it is clearly shown that the maximum numbers of the research studies, both Indian and western studies were related to the educational implications and uses about the future gadgets in education. Some of the trends in studies were linked with the availability and futurology concept related to the use of future gadget in education.

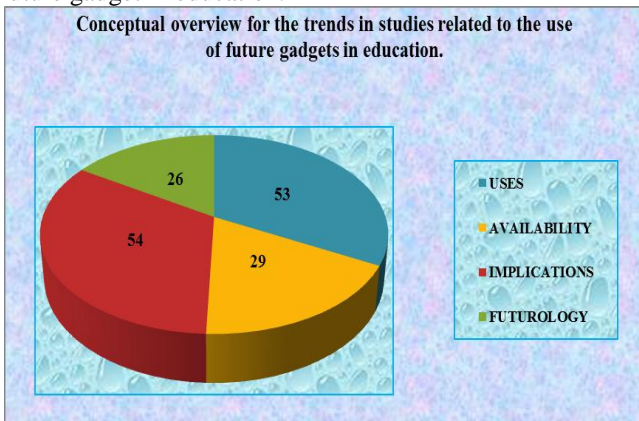


Fig. 2: Pie-representation of the conceptual overview for the trends in studies related to the use of future gadgets in education.

The Pie-representation of the methodological framework is as shown in the fig. no.-3, for the trends in studies related to the use of future gadgets in education. It can be inferred from the graph, that the maximum number of the reviews related to the research studies conducted both in India and abroad, were based on the descriptive research method while, most of the research studies were experimental in nature, the better proportion of research studies have adopted survey method, few reviews incorporated quasi-experimental, case study, and exploratory research methods, whereas least of the research studies employed ethnographic, phenomenographic and historical research method.

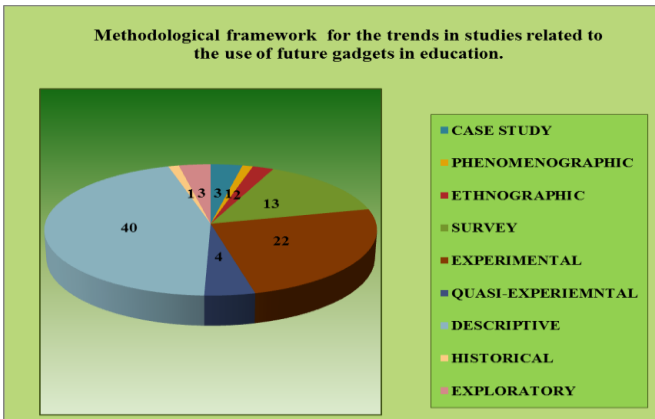


Fig. 3: Pie-representation of the methodological framework for the trends in studies related to the use of future gadgets in education.

After having overview on the tools employed for various researches done in India and abroad, it was found that the questionnaire was used maximum, most of the reviews adopted interview and pre-test and post-test as a tool. Most of the research studies have used rating scales/Likert's scale, attitude scales, and surveys as a tool. Some of them employed various tools such as recorded visual and writing sessions, online communication skills, telephone follow up, observations and group/open discussions. While, the few of them were based on email, assessment/multiple-choice questions, role play activities (RPA), assessment tests, achievement tests, intelligence tests, field-trips, writing sessions, webcams using images and sound waves, kinesthetic activities and tech up programs.

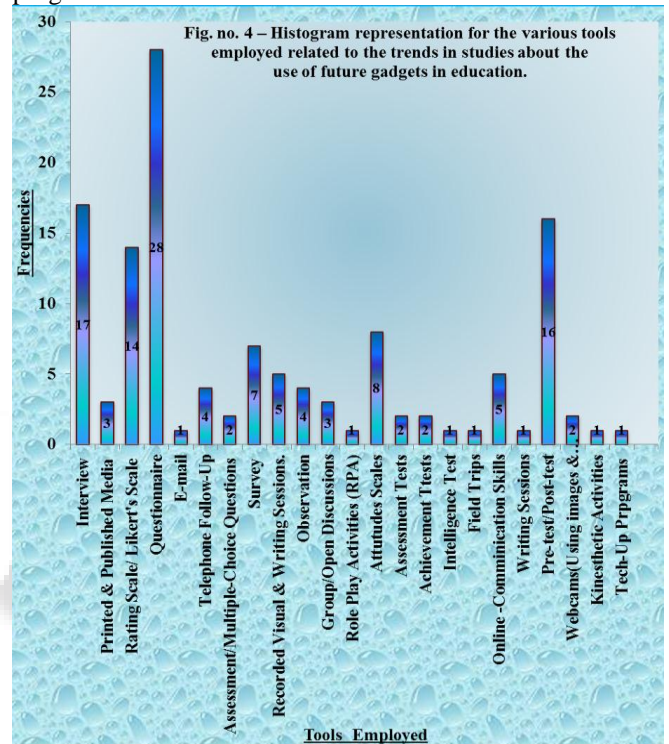


Fig. 4: Histogram representation for the various tools employed related to the trends in studies about the use of future gadgets in education.

After studying the various reviews of literature related to Indian and abroad, the researcher observed that most of the studies were related to futurology, innovations and future technology, e-learning, educational technology using latest devices and technology, M-learning, B-learning, multimedia/ICT learning, innovative technology-based learning models, and students-teacher's attitude towards ICT, CAI and conventional learning process in secondary and higher education, etc. The review has showed that a very large majority of prior studies on innovations, technology, futurology in education, CAI/ICT in student-teacher education, multimedia tools and various studies based on latest technologies were conducted in western countries and a very few prior studies have been in the Indian contexts. Thus, not a single literature directly related to the use of future gadgets in Indian educational system has been studied so far. Although, the above discussed reviews have also helped to gain extensive knowledge about various tools, resources available for measuring the concepts included in the study and thereby determine the tools to be

used to measure perceptions, utilizations, barriers and preparatory needs related to various stakeholders towards the use future technology.

Prior researches have also aided to determine the methodology of the study in that there is very little knowledge about existing future technology and innovative learning styles of students and other stakeholders and thus it is necessary to first study the futurology, innovations and innovative learning styles using descriptive method of research rather than the experimental method. In overall, it is absolutely a new innovative study in the field of futurology, innovations and future perspectives towards educational technology in a technotronic era.

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