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IMPLEMENTATION OF EDUCATION MODEL 4.0: DEVELOPING INDUSTRY 4.0 SKILLS IN GRADUATES ENGINEERS FOR IMPROVING EMPLOYABILITY SKILLS

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Abstract

Purpose of the study*:* With the growing technologies, unemployment is a big issue for youngsters, which is a big challenge in itself due to lack of skills among the youngsters The main purpose of this study is to shows, how the education 4.0, in-line with industry 4.0, to develop and optimize personalized education, would ultimately determine how young people of the future will work and live in.

Methodology: Both quantitative and qualitative data are used in this research study. For this research as a survey questionnaire is used for collecting primary data. Data Collection and analysis methods are adopted wherein the questionnaire is circulated amongst various stakeholders like engineering students, faculty and industry experts in Pune City.

Main Findings: A conceptual framework is proposed to identify factors affecting uncertainty in employability and implementation of education 4.0 model aligned with industry 4.0 to overcome these factors for developing existing education is studied here.

Applications of this study: Higher and technical educational institutes where every year more students are graduated with a technical education but a large percentage of them are not able to get employment. IT and manufacturing companies found a lack of skills in them and not ready to hire them. An educational institute is failing to fill this gap and more uncertainty in employment has occurred. This research will be helpful to the educational institutes to implement an education 4.0 model to enhance new parameters for restructuring the existing education that would be benefited for students and institutes to meet the requirements of industries.

Novelty/Originality of this study: This study has proposed a new conceptual framework of identifying the factors that cause of unemployment gap between academia and industries. This study has focused on the implementation of education 4.0 model in line with industry 4.0 where readers will learn how a new model of education will be helpful to educational institutes in developing their existing education methods as well as will be benefited to the graduated students in terms of developing skills to cope with new emerging technologies.

Keywords: *Education 4.0 Model, Industry 4.0, Employability, Skills, Engineers, Technologies, Education*.

INTRODUCTION

Employability of graduates has become an issue that isn't anything but difficult to be disregarded in the worldwide economy. It is a need to have a correct arrangement of employability aptitudes. We have significantly centered upon six abilities: specialized aptitudes, higher request thinking aptitudes, individual aptitudes, social aptitudes, nonexclusive abilities, and self-saw employability aptitudes. (Misra & Khurana, 2017).

Concerning students, I realize that having both transversal and explicit skills may enable them to build individual efficiency which ultimately allows them to feel employees, to play an important part in their social work process of inclusion and to be able to face it worldwide. Due to of increased unemployment rate for understudies advanced education must include an incentive by creating work-related aptitudes and skills. Additionally, people must create numerous aptitudes, including information securing for long-lasting and life-wide learning and dispositional employability for an unusual future (Gabor, Blaga & Matis, 2019).

To impart quality education to the society is principally the duty of the government. Education assumes an important job in the advancement of a human being; it also improves the condition of living, solves financial issues, and adds to the improvement of society.

It was found that any education system mainly focuses on specialized information and procedural application, which itself isn't adequate for employability. The instruction framework ought to likewise underline on the learning techniques to improve nonexclusive aptitudes, for example, contextual analyses, industry-based assignments, work-coordinated learning, research-based learning and role-play (Siddiqui & Meshram,2018).

In recent years, the nation is influenced by mass youth joblessness and across the board underemployment. However, the education gained at vocational training institutions doesn't meet the actual needs of the labor market, and graduates don't

have skills that they need to get desire job. The Indian Government is moving forward to address these difficulties and rebuilding the current arrangement of education in Odisha (Sarangi & Mohanty,2018).

India's change to an information-based economy requires another age of educated and skilled people. Its focused edge will be dictated by its youth's capacity to make, offer, and use information adequately. An information economy expects that India will be the larger producer of adaptable and scientific information workers and technologists who can be the driving power for the development of the economy of the nation. To accomplish this India needs an adaptable education framework that includes 1. Basic training to provide a learning environment. 2. Auxiliary and tertiary training to create core capabilities and core specialized abilities 3. Specific methods to maintain long-term learning (Srivastava, Srivastava & Gambhir, 2018).

In preparing the next generation of the workforce Institutions of higher education are responsible for their role. Higher education, Employers, administrators, and the government are the stakeholders in this conversation, especially when a discussion of the skills gap is included.

There is more uncertainty in employability in Brazil, Russia, India, and China due to a technical skills gap that will continue to pose hiring challenges. Occupations are evolving quickly; and, educational accomplishment is falling behind the requirement for skills in these nations. Employers take increasingly dynamic activity in reducing the skills gap.

To reduce the gap between employees and employers more research is needed on programs that seek to close the skills gap, evaluation of effectiveness, and generation of increased resources (Mosier & Kaiser, 2019).

A big paradigm shift in the economy, social life, health, education, lifestyle, employment, and skills development is happened due to rising of industrial revolution 4.0 (4IR). Advanced technologies may transform the structure of employability and will replace the human workforce with automation and robotics in the future. Researchers, academicians, and employers are agreed that in the next few years technological changes can lead to huge job destruction.

The skill level determines the impact of 4IR on jobs. Unemployment among graduates may occur when the skills of an individual no longer meet the skills required by jobs. The situation becomes worse when the existing skills are no longer in line with the technological developments in 4IR**.** To ensure that every individual can work in a 4IR setting, they have to develop a set of skills that will make them able to satisfy the future jobs market (Kamaruzaman et al., 2019).

Now, this is an era of the 21st century and this is the beginning of a new industrial revolution, which is industry 4.0. IR4.0 - technology enables to transform the entire structure of manufacturing companies in terms of productivity at a fast rate, quality at low cost, and economic status by replacing the human with intelligence machines. IR4.0 aims to transform in improving the production methods in Industries.

In this competitive world, challenges are the major factors that will be associated with IR4.0. These challenges are how to cope up with this new technology. It means that we have to be trained with new things and become skilled in different ways. As we know, after thousands of years the world progressed from caveman to the car and then in the next ten years, World moved from car to airplane and then it took us a few years to move from airplane to computers (Rojko, 2017).

In the industrial context, education terms described the fact that human society has experienced different phases of Industrials Revolutions in the last 250 years. Those revolutions completely changed the world of the industry but not only the world of industry; they also changed our life in all the aspects of life. In the Last 250 years, humankind has passed through those revolutions. At the beginning of the Internet age, the Fourth Industrial Revolution demands organizations to embrace a technological revolution too in education.

In the digital era, factories are moving towards the fourth industrial revolution and transforming into a smart factory. Smart factories have adopted a completely new approach to production.

According to the individual client requirements, the new approach allows the industries for mass production. Today many companies have focused on mass customization production instead of mass production. The main goal is to have a production system that can oppose any active industry processes. Such a system must be characterized by flexibility, so it can respond to interruption of various origins (Crnjac, Veža & Banduka, 2017).

Using water and steam power to mechanize production was the beginning of industry 1.0. Using electric power to create mass production was made 2nd industrial revolution. Electronics and information technology brought the big revolution in the industries across the world. That was the beginning of an automated system. Now a Fourth Industrial Revolution is a rising revolution and emerging technology i.e. digital revolution in industries where customized production is taken into account instead of mass production. The 4th Industrial revolution leads to transform the working environmental structure of factories to make them smarter and expect from the education system is increased to cope up with standards of industry 4.0 (Sakhapov, & Absalyamova, 2018).

The emerging technologies due to the 4th industrial revolution have not only a huge impact on the production itself, but also the labor market and the educational system as well is being affected. To cope with these emerging technologies only qualified and highly educated employees are required in the industries. The universities should collaborate with

industries to implement the curriculum in line with it. Now, for a highly innovative factory, skilled and qualified candidates will become the key to success to make it smarter. The education system will be shifted from Education 3.0 to Education 4.0. Actual and practical world information will be merged through education 4.0. Virtual resources, for example, glasses for virtual reality, will be used for teaching (Benešová & Tupa,2017).

In the digital era, learning becomes more collaborative. In higher engineering education, computer-supported cooperative and collaborative learning (CSCL) method supports self-driven and work-related learning processes. This method allows every student to interact with physically real equipment without being physically present at the location of the machine. Students must be included in the research process of vocational learning education to meet the required expectations in the context of industry 4.0. (Schuster, Groß, Vossen, Richert & Jeschke, 2016).

Table 1: Education 2.0 in line with principles of industry 2.0

Education 2.0	**Industry 2.0**
Production Line	Fixed, Prearranged Learning Path
QC at Each Station	Uniform Test Every Period
Station Experts	Specialized Teachers
Uniform Products	One Scale Assessment
Nobody Builds the Products	Nobody Deals with Education

PROBLEM STATEMENT

Due to uneven implementation of skills development in higher and technical education, the uncertainty in employability among the youth of India is sustained even though skill development is considered as the most important solution to overcome the unemployment problem.

OBJECTIVES FOR STUDY

The objectives of this research are:

1. To identify factors affecting employability after implementation of skills development in higher and technical education in India.
2. To propose a conceptual framework that will show the reasons for uncertainty in employability.
3. To propose an education 4.0 as learning model 4.0 to overcome the uncertain reasons in employability.

HYPOTHESES

1. Poor implementation of skills development education affects employability.
2. Poor quality of teachers, students, and less practical approach influences the employability.
3. The proposed education 4.0 model is useful to reduce uncertainty in employability.

LITERATURE REVIEW

Employability Skills

Employability is not easy to define and describe and not such a specific definition is written in any dictionaries. Over the past 20 years, increasing the attention of employability demands of skills and abilities to allow being employed (Richard Paterson, 2019).Büth et al. (2017) identified the employability gap between academia and industry as massive demand for matching training of engineering graduates in India and presented an approach to reduce this gap using the concept of Learning Factories. This gap is due to a lack of fewer employability skills in graduate engineers. To equip the students with employability skills is necessary at the time of employment through additional training. This additional training is to be time-consuming and costly for the industry. However, the five core member countries of the Association of Southeast Asian Nations are facing the biggest challenges of shortages of skilled workforce to be work in the industry (Jones & Pimdee, 2017). New competencies and skills will become more important for them as today's students are dealing with will deal with an increasingly globalized, automatized, virtualized, networked and flexible world, new competences and skills will become more important for them (Motyl, Baronio, Uberti, Speranza & Filippi, (2017).

Richard Paterson (2019) summarized the source and consequence of the Uzbek higher educational policy of employability as a term related to higher education. Many universities integrate pedagogy in their programs to improve employability. The point is that the best way to leverage the ideas of pedagogy for employability is to appeal to the ideas of pre-professional and graduate identity and, more so, to consider how the learning process can better be used by lecturers and students. At Indian universities and colleges delivering education is not sufficient to train the students and ready them for the industry. As the gap is set up between the industry ‘s expectation and students’ performance, there is a need to bridge this gap by the implementation of the Learning factory approach at a leading university in India. It is expected that to meet the requirements of the industry, in university and colleges the proposed learning framework will

produce the skilled graduate engineers and the additional training to be required for the graduate engineers at the time employment in the industry will be redundant. (Büth et al., 2017)

Emerging digital technologies are going to be threatening to make jobs obsolete in service and manufacturing industries both (Jones & Pimdee 2017). The diffusion of emerging digital technologies i.e. industry 4.0 structure has led the competence for the students and academia. (Motyl, Baronio, Uberti, Speranza & Filippi, (2017). In the 21st century, industrial 4.0 is taking place at a global scale therefore advance technologies are causing a paradigm shift on the existing educational system (Barros, 2019). Along with the changing in technologies, the qualifications' expectation from individuals has also changed. Universities have to make an extensive change and transformation in all levels of education to educate students with professional skills (Kamisli & Ozonur, 2019). To produce industry-ready skilled graduates and make them suitable to be work globally, there is pressure on higher education institutions (HEIs) of the world (Richard Paterson, 2019).

Industry 4.0

Motyl et al. (2017) investigated how due to rising Industry 4.0, the educational needs of students and the industrial workforce are changing rapidly. To meet the standards of the Industry 4.0 framework, the investigation is needed to find out the required proficiency of graduate engineers to be fit for better employment. Industry 4.0 and the underlying technological innovations can influence the relative importance of future skills (Barros, 2019). Integrated systems like embedded systems, robotics, and automation system are the new revolution in the digital world. Its implementation in different sectors likes manufacturing, education, health, and tourism, etc. needs more transformation from man to machine (Kamisli & Ozonur, 2019).

Education 4.0- Learning Assessment

As the working structure of the industry is transforming rapidly in the current digital era, industry4.0 is the reason to believe that educational institutions will need to rethink their existing learning practices (Barros, 2019). In line with the characteristics and components of IR 4.0, education 3.0 must be revised with education 4.0 in such a way that skills are to be developed in students and train them to be ready to meet the expectation of industry (Majid, 2018). Transforming the structure of the education system in line with industry 4.0 standards by the development of education 4.0 model ones that enable future graduates to handle their future working roles is needed (Barros, 2019). Majid (2018) has focused on how universities in Malaysia are adopting the methods of delivery and assessment to provide a common trend among the universities and specific strengths of each university in meeting the demand of industry revolution 4.0. The author has compared the TESL program as Education model 4.0 that includes the practical and social skills that are required to the students in managing the professional and social responsibilities. Proposed Education 4.0 model includes managerial and entrepreneurial skills that are required in managing or solving the problem, and working in a team as a leader at the workplace.

The arrival of 4IR with a combination of communication, IT data and physical system in industries, can lead the job loss in the next coming years. This revolution will update and restructure the industries' function to be smart factories. To cope with the standards of IR4.0, more skills are needed and a more trained workforce is demanded. Lack of Employability skills in passed graduate students can make them jobless and somewhere assessment and learning strategies adopted by the universities or colleges in their education system is not innovative and effective (Sohimi et al., 2019).

To offset these problems educational institutions have to take necessary steps for sustaining the growth of education level (Jones & Pimdee 2017). In this study, the strategies plan is identified that can be used as guidelines by the universities to have to tie up with industries for redeveloping the curriculum content to instill the skills gap in current content (Sohimi et al., 2019).

Jones & Pimdee (2017) showed, the use of the S-curve to describe the implementation of the legacy of proceeding Thailand 1.0, 2.0, and 3.0 to meet the objectives and support Thailand 4.0, the digital/e-commerce agenda, agribusiness, and 'smart farmers in Thailand.

Kamisli & Ozonur, (2019) focused on the importance of vocational education included in students' learning styles in ever-changing technological and business developments. In the professional competencies world, Education 4.0 (Skill Based Education) plays an important role to train the youth and produce a high-quality workforce for the industries. Encouraging innovative higher education, increasing quality tertiary education accesses for motivated students, which can ensure that higher education graduates possess employability skills (Richard Paterson, 2019).

Need for Framework of Education Learning Model 4.0:

The framework of Education Model 4.0 must include:

Tailor-made Learning Path

Education through Tailor Made Learning method is a private, individualized learning knowledge that seeks to meet the

needs of each student through a tailor-made educational plan.

Decisive Assessment

To instill the skills in the students, Formative evaluation, including problem-solving testing, are to be conducted and these formal and informal assessment trials are to be adopted by the faculty in their teaching process to enhance the students' learning skills.

Teachers become Mentors

Mentoring is long term connections that meet a development need, helps develop full prospective, and benefit all partners – mentor, mentee and the organization. The purpose of mentoring is to give support, supervision, and suggestion to teachers to enable them to improve their teaching skills to develop professionally.

Divergence and Pluralism

The quality of students may not have the same at the education level. The basic idea of implementation of education model 4.0 is to provide a supportive platform to the students for identifying and excelling their skills and help them to choose their interesting field where they can be suited.

Education is the goal

To design an education model system to provide full access to technology resources and to give a platform to them in developing reanalyzing, recreating and rethinking strengths individually.

Continuous teachers training

To maintain the quality of education and the relationship between mentor and mentee, teachers must go under continuous skill development programs during their careers.

To implement education 4.0, universities and college must revise the educational paradigms and focus on the areas that to be added and deleted in a new proposed education system. In Today's new world as the technologies are changing rapidly, skill education or training is needed to equip the students with practical knowledge. Universities or colleges must adopt a flexible learning structure instead of adopting a rigid structure.

METHODOLOGY

Both quantitative and qualitative data are used in this research study. For this research as a survey questionnaire is used for collecting primary data. Data Collection and analysis methods are adopted wherein the questionnaire is circulated amongst various stakeholders like engineering students, faculty and industry experts in Pune City.

The questionnaire method is chosen among the other methods for several reasons, such as low cost, the time and effort required in gathering data from a large sample, and geographic separation.

Table 2: Outline of the study

Intersection	Engineering students	Employees	Faculty
Participants	50 Engineering Students 20 - 25 years old 34 Male and 16 Female The average age is 23 years old	30 Engineering Industries' Employees 25 – 40 years old 17 Male and 13 Female The average age is 29	50 Engineering Faculties 30 – 45 years old 37 Male and 13 Female The average age is 33
Occupation	Students	IT & Non IT Professionals	Engineering Professionals
Duration	1 Weeks	3 Weeks	2 Weeks
Evaluation of the Study	Survey method	Survey method (Questionnaire)	Structured interview

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Participants

The random sampling technique was used during the selection of participants and the experimental study was conducted in selected technical institutes and universities in Pune city.

Sampling

Engineering Students: 50 randomly selected students in the 20-25-year-old age group were included in this study.

Faculty Members: 50 randomly selected engineering faculties in the 30-45-year-old age group were included in this study.

Employees: 30 employees of engineering industries participated in the study. Out of 30 participants, 17 participants were male. The average age of an employee was 29 years old.

DISCUSSION / ANALYSIS

Analysis of Factors Affecting Employability

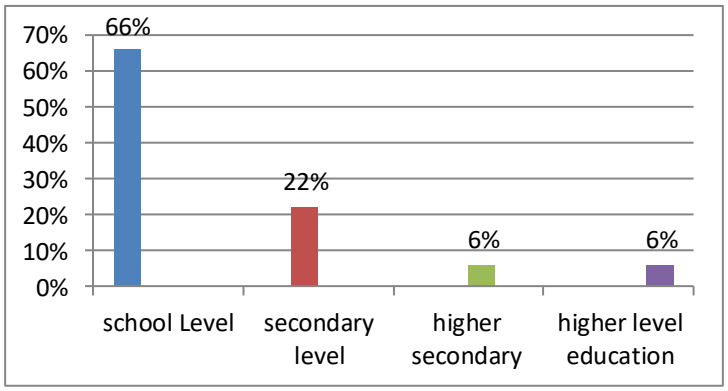

Figure 1: Percentage of respondents' perception towards skill development education Implementation at the different education level

Figure 1 shows that according to 66 percent of respondents, skill development education must be implemented at the school level and should focus on practical skills.

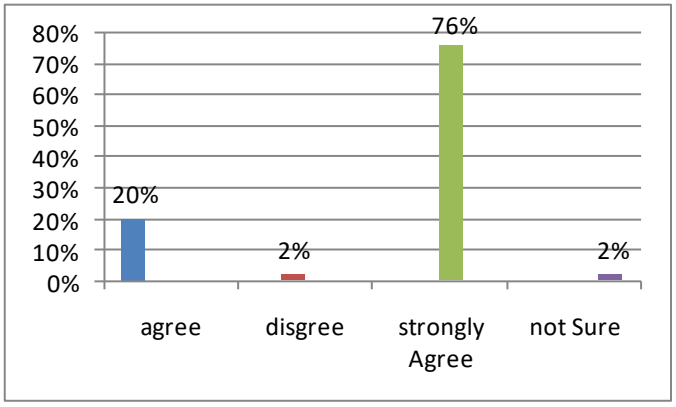

Figure 2: Percentage of respondents' perception towards skill development education implementation's usefulness at higher level education

According to the response shown in figure 2, 76 percent of respondents think that the implementation of skill development education at higher level education will be more useful for the students to develop their skills along with higher education what they are doing.

In figure 3, high percentages of respondents think that due to the implementation of skill education-based curriculum with poor quality and poor quality of teachers are the main causes of uncertainty in employability. 60 percent of respondents' opinion shows that somewhere there are shortcomings in the existing implemented curriculum which is not more practical oriented content.

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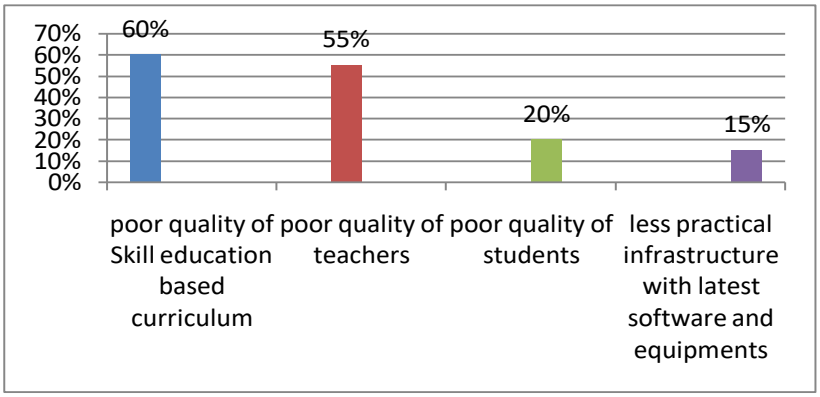

Figure 3: Percentage of respondents' perception towards uncertainty in employability after implementation of skill development education at higher level education

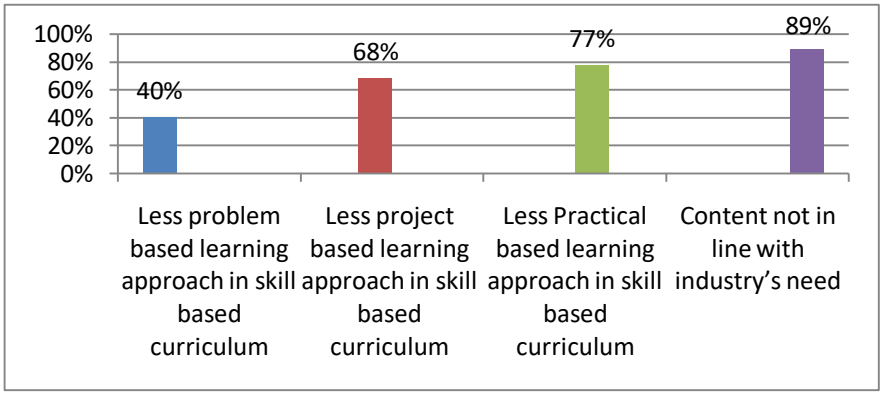

Figure 4: Percentage of respondents' perception towards the quality of skill development education-based curriculum

Figure 4 shows that according to 89 percent of respondents' opinion there is more uncertainty in employability and the main reason for this is content implemented by technical colleges and institutions not designed by keeping in mind industrials' needs or requirements. On the other hand, 77 percent of people think that the current implemented curriculum has less practical content and according to 68 percent, respondents incorporating a more project-based learning approach in skill-based content will be more beneficial for the students to get the employment.

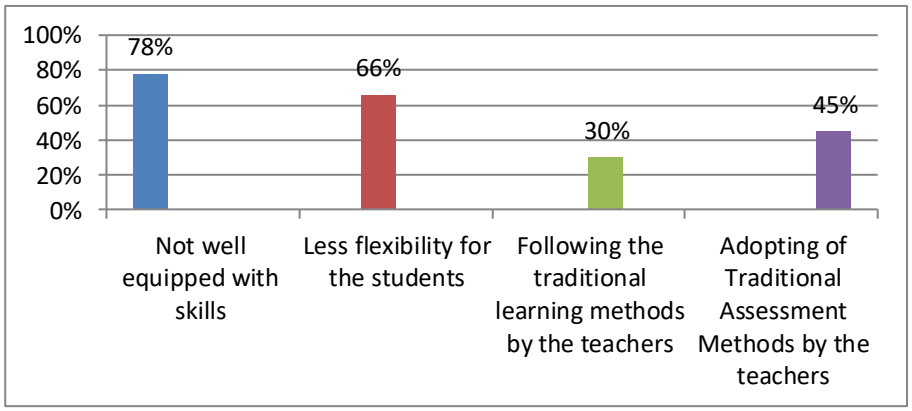

Figure 5: Percentage of respondents' perception towards the quality of students

Figure 5 states that the quality of students is more affecting due to not equip them with proper skills and less flexibility is given to them. In the digital era, somewhere still traditional learning and assessment methods are being adopted by the faculty members.

Figure 6 shows that according to 88 percent of respondents, institutions do not have more focus on conducting faculty development programs to enhance the practical knowledge of the teachers, as well as less involvement of teachers in research work, which affects the quality of teachers. On the other hand, 76 percent of respondents have the opinion that the selection process followed by the institution for recruiting the teachers is poor and 77 percent of respondents think that frequently, quality assessment of the teachers is needed.

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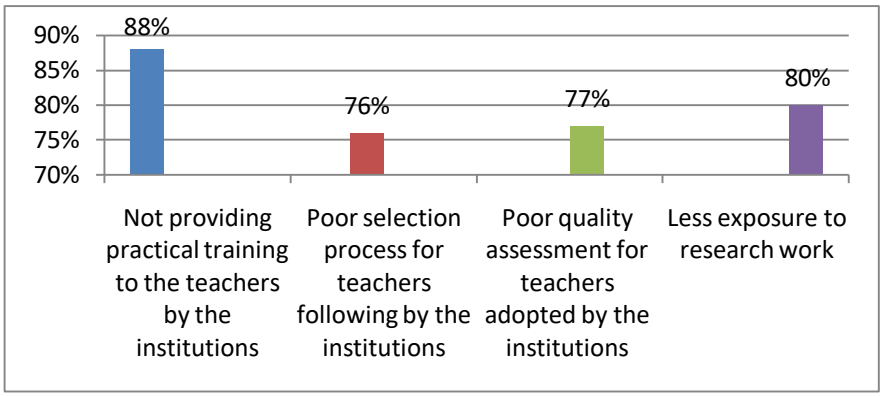

Figure 6: Percentage of respondents' perception towards the quality of teachers

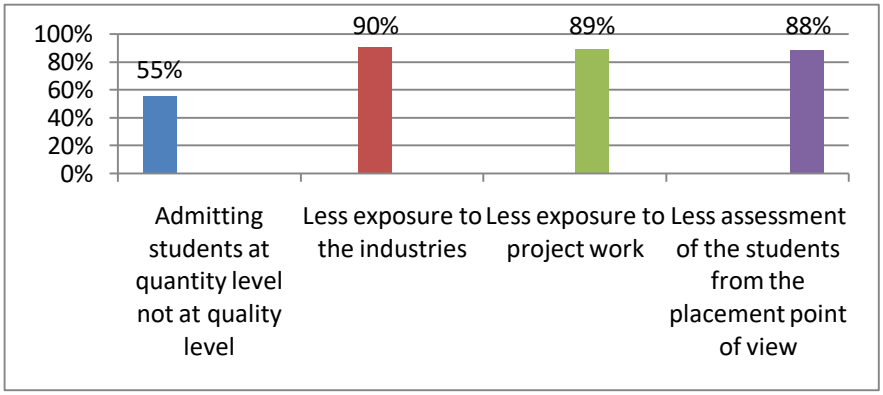

Figure 7: Percentage of respondents' perception of the quality of technically unfit students

Figure 7 highlights the percentage of respondents on different factors that affect the quality of students and make them unfit for the technical professional. A 90 percent respondent says that due to less exposure to industries, students have less practical knowledge and not able to meet industries' needs. According to 89 percent of respondents, students don't get more chances to work on live projects during their academic session that blocks the exposure to the students for implementing new ideas or thought practically.

On the other hand, 88 percent of respondents have the opinion that assessment of the students from the placement point of view is not conducted at the end of institutions or universities Due to this, industries do not hire them and reject them as unfit for the job.

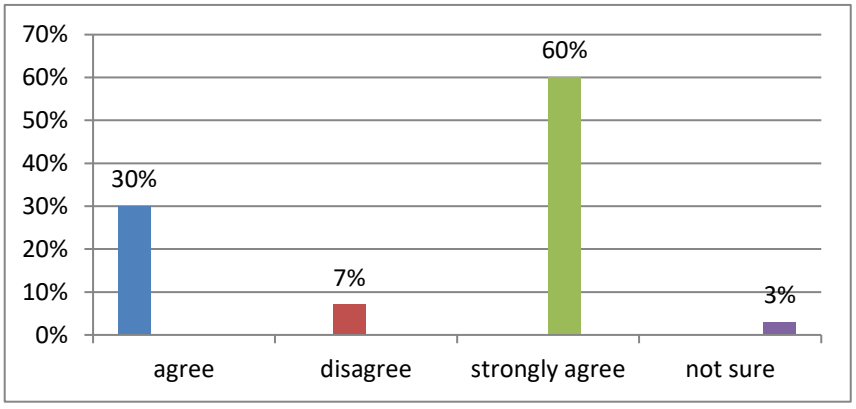

Figure 8: Percentage of respondents towards the current implemented education system in line with the principle of industry 2.0

Figure 8 shows that 60 percent of respondents are agreed that the currently implemented education system is in line with industry 2.0. It means still, institutes are following traditional methods of learning that includes fixed and predefined learning methods.

In figure 9, it is clear that 70 percent of respondents think that somewhere in the 21st century, institutes or colleges have adopted fixed and predefined learning paths for the students, as well as they, are using one scale method to evaluate

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them. All methods are predetermined. 66 percent of respondents have an opinion that, for evaluation of the students, the uniform test pattern is implemented by the institutions or colleges.

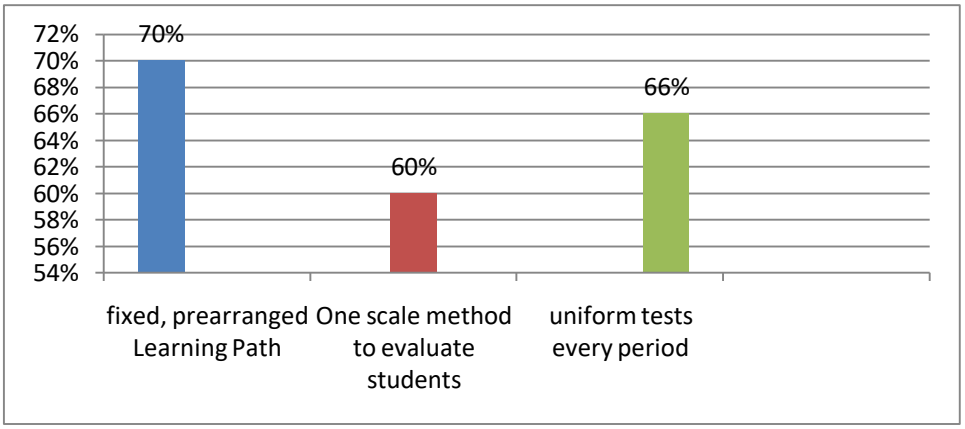

Figure 9: Factors affecting the needs of industry

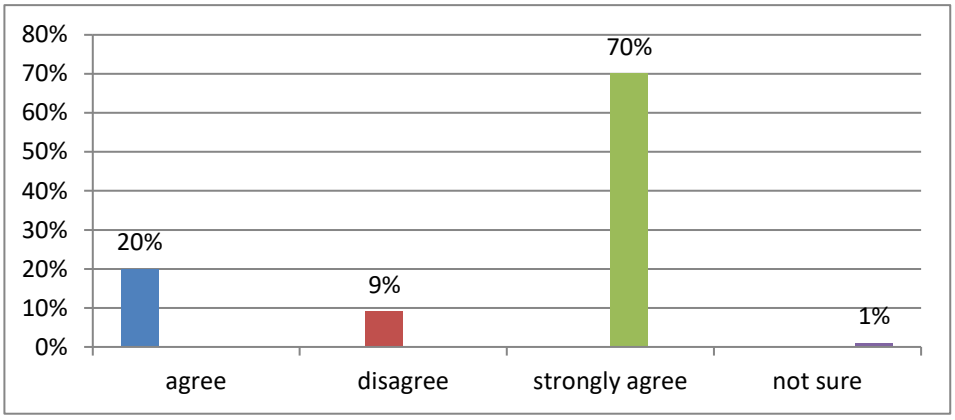

Figure 10: Current education system is not in line with industry 4.0

70 percent of respondents projected in figure 10 are strongly agreed that the current education system is not in line with industry 4.0. Adopted education systems do not meet the need of the industry. Being less skills-oriented content in the existing curriculum, it is not effective and efficient to equip the students with practical knowledge to meet the industries 4.0' need.

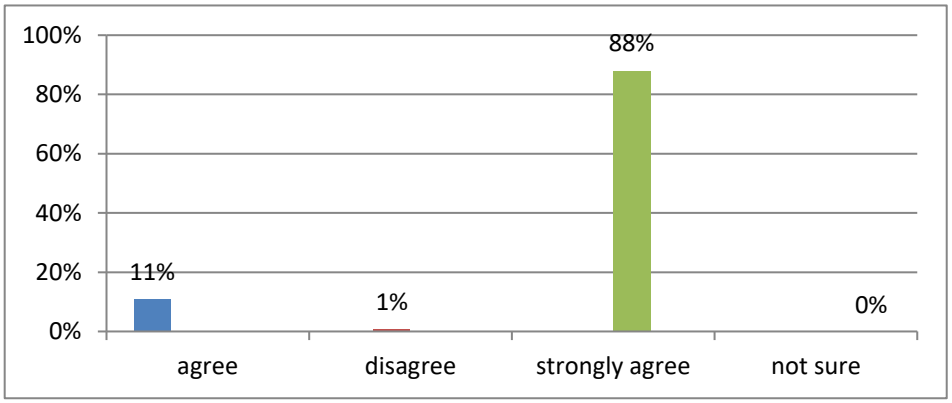

Figure 11: Respondents' perception towards the implementation of education 4.0 model

The above-discussed factors are the reasons for more uncertainty in employability. It needs to be finding the best solution to come out form the uncertainty in employability. Figure 11 shows the respondents' view of the implementation of the education 4.0 model. 88 percent of respondents are strongly agreed that if education 4.0 models are implemented or adopted by the technical institutes and colleges, it will be helpful to bring the education system in line with industry 4.0. If it is executed effectively and efficiently then students will be well equipped with skills to meet the industries' needs.

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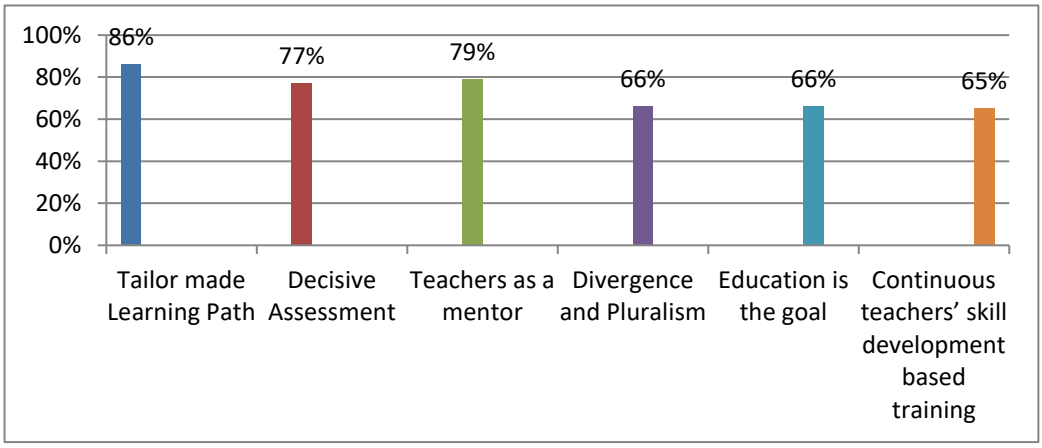

Figure 12: Education model 4.0's factors reducing the gap of employer's expectation and employee's aspiration

Figure 12 shows the parameters including in education model 4.0. According to the response of 86 percent respondents, instead of using fixed and predetermined methods, technical institutes or colleges must follow a tailor-made learning path where private, individualized learning knowledge pattern is implemented. On the other hand, 76 percent of respondents think that decisive assessment is important that includes problem-solving testing to improve students' skills. 79 percent respondents say that teachers must work as a mentor that meets development need to enable them to improve their teaching skills.66 percent respondents have the opinion that education model 4.0 must be implemented in such way that it can assist the students for identifying the field in which they are well-suited and help them to do extremely well at it. According to 66 percent of respondents, the goal of education must be floppy where students can have full access to the latest technologies resources and it must provide the platform for them in developing reanalyzing, recreating and rethinking strengths individually. 65 respondents projected in figure 12, say that to sustain the excellence of education and, teachers must go under continuous faculty skills development programs during their career.

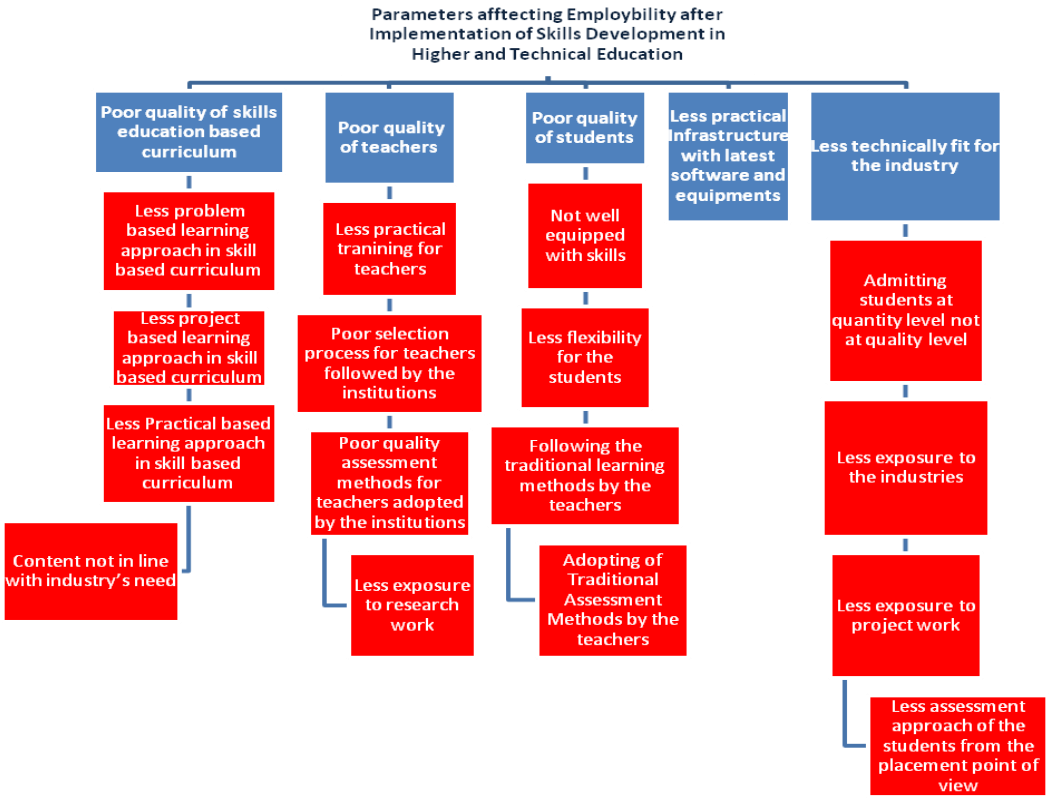

Figure 13: Proposed Conceptual Framework for Identify Factors affecting Uncertainty in Employability

Factors associated with current education system adopted by technical colleges and institutions

Implementation of precision education system at higher and technical level education can be the one best solution for improving the current education system, however; the following factors are observed in the current implemented education system by the technical colleges and institution.

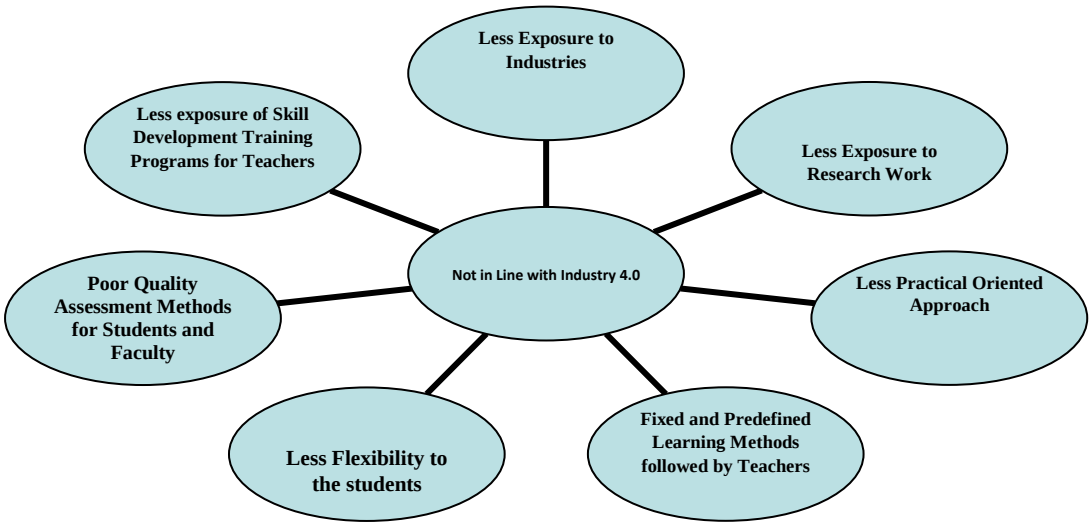

Figure 14: Factors associated with currently implemented education system affecting employability

SIGNIFICANCE AND PREDICTABLE OUTCOMES

The proposed research outcome gives the reasons for potential uncertainty in employability after the implementation of skills development education by technical colleges and institutions in India. This research focuses on the analysis of major factors affecting employability after implementation of skills development education in higher and technical education level. The framework will be proposed based on available parameters affecting employability that could be used as a guideline for the technical colleges and institutions in the future for the implementation of skills development education along with higher and technical education in a better way.

CONCLUSION

Proposed conceptual framework useful to the technical colleges and institutions to rework on parameters affecting employability for better implementation of skills development education to reduce uncertainty in employability.

It is the time to bring the new structure of education into the 21st century by introducing and implementing Education Learning Model 4.0 in line with principles of industry 4.0. A new challenge for educational organizations to prepare the young generation for the next industrial revolution. This is possible giving them better education through flexible tailor-made curricula and through teachers who will become mentors and treat them as individuals. Another challenge will be for education organizations giving the workforce of tomorrow to meets the needs of industry 4.0's principles. One more challenge has to face by education organizations where they have to produce active lifelong learners to create a society for the people who can understand their strengths for building a fair and self-sustaining model for skills rather than knowledge.

Therefore, the education learning model 4.0 needs to go through a total resistance and reformation of the education world. The big challenge of Education 4.0 is to prepare youth for **"Job Creation"** than the existing focus on **"job seeking.**

LIMITATION AND STUDY FORWARD

This research was limited to the technical institutes and colleges in Pune city. Further research can be possible to find the real effect on employability after the implementation of education model 4.0 in technical institutes and colleges.

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AUTHORS CONTRIBUTION

Dr. Geetali Tilak contributed significantly to the conception and design of the study, and critical revision of the article. Dheeraj Singh contributed substantially to the acquisition of data, the analysis and interpretation of data and drafting the article. Both authors discussed the results and contributed to the final manuscript to be published.

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