English Language Learning Using Education 4.0 in Karimnagar, India

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Abstract

This study presents English language learning using Education 4.0 in Karimnagar District. Many educational institutions in Karimnagar are equipped with technology-based learning that is Education 4.0. Education 4.0 creates innovation in learning. Students can learn at their base, creating a self-learning opportunity for them. Most of the subjects have been learned through Education 4.0. Consequently, English is also learned by Karimnagar students using Education 4.0. This study aims to analyze the impact of Education 4.0 on English language learning in Karimnagar. For this purpose, survey-based research has been conducted in the engineering colleges in Karimnagar. The study adopts quantitative analysis. The SPSS software has been used to analyze the data collected from the selected educational institutions. The results have shown a significant impact on English language learning while using Education 4.0 as a tool. This self-supported flexible learning system helps the students to learn effectively. This study also recommends that future studies may be conducted in other places in India and abroad to find out the usefulness of Education 4.0.

Keywords: Education 4.0, English for Academic Purposes, Language Learning, EFL

1. Introduction

Education 4.0 is equivalent to Industry 4.0, and it changes the entire system of all the fields, especially the system of education into digitalization (Srivani, Hariharasudan Nawaz & Ratajczak, 2022). Education 4.0 has become the trend and makes a tremendous change in the field of education by technology (Pangandaman, 2019). The elements of Education 4.0 are gamification, quizzes, riddles, puzzles, and some learning applications: Duolingo, Byjus, Photomath, Sololearn, and Kahoot (Nawaz, Durst, Hariharasudan & Shamugia, 2020). These applications help learners gain knowledge through puzzles, quizzes, audio, and video. The Education 4.0 system is very useful and upgrades the learners' capacity. This system stimulates the learners and teachers to gain more knowledge through technology (Rahiman, Kodikal, Biswas & Hariharasudan, 2020). Most of the students are not effective, and they are not willing to listen to the method of a blackboard. Technology only elevates the learners' minds and motivates the students to learn through technology and using various tools. English is a second language though many people use this language (Hariharasudan, Rahiman, Nawaz & Panakaje, 2021). Students find it difficult to learn this language for secondary languages, but technology changes the education system into the internet. Through technology, the students can learn the language easily.

The following studies are related to Education 4.0. The study of Steffen Tram Mortensen, Kelvin Kolds ø Nygaard, and Ole Madsen abbreviates that industry 4.0 is a game that converts the world into digitalization. The authors create awareness about industry 4.0 because it is full of technology, and the education sphere is influenced by industry 4.0. The authors analyze education 4.0 with a deck of cards (Mortensen, 2019). The study of Vichian Puncreobutr states that there is more advancement in all the fields through technology. So the learner must respond to all the skills and learn many things by using technology (Thavabalan, Mohan, Hariharasudan & Nawaz, 2021). It is a challenge for the learner to seek the information (Puncreobutr, 2016).

2. Literature Review

The study of Fernando Almeida and Jorge Simoes abbreviates the role of gamification and how Industry 4.0 tools in

Education. The authors elucidate that Education 4.0 is a new trend in technology and creates a potential for the fourth industrial revolution. The authors intend to focus on Education 4.0 and gamification through technology, especially Industry 4.0, how it transforms into Education 4.0. And then, the authors mentioned 25 case studies conducted in Portuguese higher education organizations (Simoes, 2019).

The study of Hariharasudan, Robert Gnanamony, and Rajaram acquainted the communication skill for Engineering Students in Southern Tamil Nadu because communications skills are a progression for their profession and career. The authors motivate the students to learn English, which molds their skills and is job-oriented. The authors stated the descriptive statistics among the students of the first, second, and third-year (Hariharasudan, Gnanamony & Rajaram, 2017).

The study of Hariharasudan and Sebastian Kot are analyzed regarding scoping review method and explicit that both Education 4.0 and Digital English. The authors investigated the relationships between Education 4.0 and digital English and demonstrated the significance of Virtual English and Education 4.0 in Industrial 4.0. (Hariharasudan & Kot, 2018).

The study of Priya Sharma highlights Industrial Revolution 4.0 in the system of education. Sharma abbreviates that Education 4.0 is highly beneficial to the teachers for teaching innovatively. They can utilize many techniques and tools and make the students learn more ideas. Education 4.0 makes good outcomes in both learning and educational systems among the students (Sharma, 2019).

The study of Alemi Minoo shows how English language teaching is involved in technology. Both teaching and learning have various stages through technology in the field of education. Alemi abbreviates the four skills: listening, speaking, reading, and writing through technology (Alemi, 2016).

The study of Cagatay Catal and Bedir Tekinerdogan highlights that technology emerges in all fields, especially in education for learning, teaching, life sciences, etc. The authors provide the framework of Industry 4.0 and how education is influenced by technology. They mention the role of education in life sciences (Catal, 2019).

According to Candradewi Wahyu Anggraeni's research, Education 4.0 is a new educational framework that emphasizes creativity and technology. The author elucidates three challenges: teaching method, student's speaking ability, and facilities for the use of technology or some other tools. And then, the author motivates the students to access Education 4.0 (Anggraeni, 2018).

The study of Haslinda Abdullah, Lim Fung ching, and Rasika Lawerence, state higher education in Malaysia, and they had implemented Education 4.0 with the fourth industrial revolution (Thavabalan, Mohan, Hariharasudan & Krzywda, 2020). The authors analyze both positive and negative roles of Education 4.0. With the development of technology, the teaching method has changed and adopted many tools for handling classes (Lawrence, 2019).

The study of Mourtzis, Vlachou, Dimitrakopoulos, and Zogopoulos states that industry 4.0 is sustained by technology and plays a vital role in manufacturing education. The authors mention that advanced education leads to a good progression in manufacturing. Industry 4.0 reshapes the education system into digitalization and also develops skills (Mourtzis, 2018).

The study of Candradewi wahyu Anggraeni promotes education 4.0 for survival classrooms and explains education 4.0 through the use of Whatsapp and Instagram. The author used a qualitative approach for his study and pointed out education 4.0 in two different sides: lecture and students in English Language Teaching (Anggraeni, 2018).

The study of Esdras Paravizo, Omar Cheidde Chaim and et al. abbreviates that to explore gamification for manufacturing education because the students can learn through gamification, and some games attract them. It teaches students puzzles, quizzes, riddles, and so on. The authors mention that gamification supports the education system on industry 4.0 and motivates the learners to learn more (Paravizo, 2018).

The study of Barbara Motyl, Gabriele Barbara and Stefano Uberti et al. rhetorically illustrate the topic. The authors explain how to change the skill of an engineer in the industry 4.0 design, and it is a difficult task for the engineer to convert their skills into an industry 4.0 framework. The authors include the questionnaire survey also (Motyl, 2017).

The study of Chu-Chi Kuo, Joseph Shyu, and Kun Ding points out industry 4.0 and makes comparative analysis among the USA, Germany, and China because they are developed in technology and use of technology in different aspects for different fields, especially for education. And then, the authors share about innovation and technology among those countries (Kuo, 2019).

The study of Cristina-Claudia Osman and Ana-Maria Ghiran states that everything depends on technology becomes digitalization. The authors mention the challenges of industry 4.0 and are explicit about various techniques. The

authors promote the process of mining and its approach in industry 4.0 and share about online courses also (Osman, 2019).

The study of Elisa Tosello, Nicola Castaman, and Emanuele Menegatti affirms that using robotics to train the students is an updated one and knows everything regarding technology that is The authors suggest robotics to train the students. They have to gain much knowledge from robotics. The authors collaborate with humans and robots and they are related to industry 4.0 (Tosello, 2019).

The study of Jameel Ahmed suggests that English subject teachers may understand the difficulties while teaching for those who are considered English as a second language. English teachers must use media during their classes to motivate the learners to learn the English language. And then prefer technology-based tools for teaching to gain knowledge (Ahmed, 2012).

The study of Karolina Werner-Lewandowska and Monika Kosacka-Olejnik mentions logistics and how it is developed through technology. The authors prove logistics 4.0 and its various models. Logistics 4.0 is connected with society for the development of the industry. The authors survey logistics (Werner-Lewandowska, 2019).

The study of Joshua Grodotzki, Tobias Ortelt, and Erman Tekkaya state that virtual labs for students are necessary and mandatory for institutions. Through virtual labs, a teacher may show some images, videos, audios, and so on to develop the skills of the students. Especially virtual labs for engineering students are compulsory because they are connected with technology and innovative tools or equipment according to technology. In the lab, the students can overcome the limits of innovation and experiment with many devices (Grodotzki, 2018).

The analysis by Ishwar Singh, Dan center, Mo elbestawi, and Tom wanyama abbreviates the organization of the smart factory by technology, but the authors note that not all production lines are supported by technology in certain factories. Technology is very important for smart factories, and some implementation for smart factories is recognized by the authors (Elbestawi, 2018).

The research by Mashhadi et al. shows that Digital classrooms(Education 4.0) are a critical instrument in Education 4.0.0, thus encouraging and enhancing existing approaches through the use of English. This enhances the quality of education by improving the connection between educators and students worldwide. Their research also notes that learning English with Education 4.0 makes it versatile to gain knowledge hours, such as during daily class hours (Mashhadi and Kargozari2011).

Anggraeni performed a poll in a survival class on the promotion of the English language in 4.0. Although supporting Education 4.0, three obstacles have been revealed: concentrating on lecturers' teaching methods, students' speaking abilities, and services. Furthermore, those problems need to be highlighted by lecturers and students and solved (Anggraeni2018). Many experiments have also been undertaken to determine the relevance of Education 4.0, but to our understanding and literature consideration, the researchers argue that such analysis is not carried out by suggesting that Education 4.0 is a gateway to Business 4.0.

Both experiments are related to Industry 4.0, but each study differentiates the term. These experiments are performed in different parts of the world—the importance of mastering the English language using education 4.0.

The constructivist approach, business, and academia are known to be English and the language of the digital media. Internet consumption ramps up the tempo of globalization. Digital English is referred to as the platform and electronic form of English in the digital world. Visual English and the Internet, in most situations, are incompatible. While several languages are used on various websites, the majority group of Internet users prefers English, and web content (Flammia and Saunders 2007).

On blogs, the supremacy of digital English makes language the mainstream on the Internet. Most of them think that, for a long time, digital English has been the main language of the internet today, and the most common search engines are only built-in English. The statistics below illustrate the world's internet penetration in English.

Table 1 displays the worldwide web top ten languages. Compared to other languages, English is at the top of the list of Internet languages. Even though the Chinese population is similar to the English equivalent, the proportion of English web users is substantially higher, at 25.3 percent. In comparison, the proportion of Chinese users is 19.4 percent, and the majority of respondents who use Chinese as their internet language is relatively small than the ratio of English users. It also demonstrates that the non-English speaking community, barring Chinese, is quite tiny and does not, in any event, overlap with the English language. In addition to the numbers in the table, it is clear that the majority of non-English-speaking people continue to utilize English in their daily lives and on the Internet (Hodic' 2013; Crystal2003; Zikmundov á2016).

Table 1. Top ten languages on the Internet

Internet's Top Ten Languages	World Population for the English Language	Language by Internet Users	Internet Penetration	% of Internet users around the World
English	1,46,20,08,909	1,05,27,64,386	72.00%	25.30%
Chinese	1,45,25,93,223	80,46,34,814	55.40%	19.40%
Spanish	51,57,59,912	33,78,92,295	65.50%	8.10%
Arabic	43,56,36,462	21,90,41,264	50.30%	5.30%
Portuguese	28,64,55,543	16,91,57,589	59.10%	4.10%
Indonesian/Malaysian	29,92,71,514	16,87,55,091	56.40%	4.10%
French	12,71,85,332	11,86,26,672	93.30%	2.90%
Japanese	14,39,64,709	10,95,52,842	76.10%	2.70%
Russian	40,56,44,599	10,80,14,564	26.60%	2.80%
German	9,49,43,848	8,47,00,419	89.20%	2.20%
Top 10 Languages	5,13,52,70,101	3,20,66,13,856	62.40%	77.10%
Rest of the Languages	2,49,94,88,327	95,03,18,284	38.00%	22.90%
World Total	7,63,47,58,428	4,15,69,32,140	54.40%	100.00%

The use of Education 4.0 for English language learning applies to all regions. In the new age, Education 4.0 is a critical weapon. The Internet of Things (IoT)'s conscience is the Internet (Vermesan and Friess 2013). IoT expands the interrelationship of humans. It is one of Education 4.0.'s most significant features. IoT represents a prominent role in human life in this new age, equivalent to our shades. Without IoT, the ordinary life of humanity cannot have mobility: without its wheels, a car can not travel. It enables people to link on a peer-to-peer basis worldwide (Draishpits 2016). Consequently, new theories, new definitions, and new interpretations have taken root very easily. Industrial IoT technologies are used in various applications, including Smart House, Urban Scale Implementation methods, Medical and Hospitals, Senior Care, and Logistic support, Business Technologies, Support Processes, Engineering, Agricultural, Waste Efficiency, Environmental Control, Building, and Home Automation.

English has been used mainly as the medium of communication in all advanced applications using Education 4.0 since English is used as the digital world's major language. English is continuously adapting using Education 4.0, but these modifications have emerged more quickly as the internet advances rapidly in current history.

As personalities, we develop our ways of communicating new knowledge and responding to various communication media. As the contemporary era has altered how we communicate, so has the way we use language. English is also used digitally, which leads to developing and implementing an online communication strategy in IoT industrial applications. It's also clear in IoT's scripting language. The top six IoT operating systems are C, Java, Python, JavaScript, Swift, and PHP, and the illuminating keywords used in such software programs are also in English.

There are, however, several studies available that refer to the applications and benefits of IoT (Talari et al. 2017), the application of technology in teaching and learning in the English language (Solanki 2012; Gunuç and Babacan 2017; Kalanzadeh et al. 2014), but no such study has been carried out on the use and necessity of digital English in IoT or Education 4.0.0 to the best of our knowledge (Flammia and Saunders 2007).

2.1 Identified Gaps and Justifications

The research conducted in the field, such as Digital English, Education 4.0, and Industry 4.0.0, are thoroughly summarised. The authors' primary goal is not to discover research gaps or to expose such deficiencies. In other words, the analysis concentrates on identifying the gaps and instead focuses on evaluating the literature available. However, it is surprising that the studies carried out in these fields are so narrow, concentrating on only one of the above-mentioned contexts; no research has been conducted to investigate or state the relationships between these topics. Many of us would believe that a comprehensive body of study is necessary for the field of Digital English and Education 4.0 to work in Industry 4.0 due to rising demands and expansion in business automation. While more research has been carried out in these fields over the past few years, these findings are unique and not interconnected; the existing literature also includes gaps.

2.2 The Research Gaps Are Identified by the Authors as Follow:

According to the research, studies on Education 4.0 and English language learning have been conducted, and both are linked and productively implemented in many areas. There is, however, a disparity between the implementation of Education 4.0 and its effectiveness in other topics. This discrepancy must be addressed to have the best learning experience possible. Even though English is the medium of all communication in the globalized digital world, no study has been conducted on the demands of Digital English in one of the Education 4.0, Internet of Things

applications. IoT is fast expanding in many aspects of our life, and the majority of them will profit from its use. This reduces cognitive power and helps with interdependent activities.

On the other hand, virtual English is the most commonly used language for IoT applications. According to us, although several programs employ Digital English in IoT or Industry 4.0, and despite research findings, no study has been conducted to determine the effects and importance of Digital English in Industry 4.0.

To understand the consequences and meaning of digital English in the implementation of Industry 4.0, such as advice, procedure, instructions, interactions, and so on, research must be conducted.

To understand the implications and significance of Digital English and to effectively introduce Industry 4.0.0, professionals, business people, and corporate companies are being encouraged to address the gap in this field.

One of the most significant problems when integrating Industry 4.0 is a lack of preparation or knowledge. For learners that like to learn in the digital world, the Information and Communication Technology (ICT) approach, online learning, or any other Education 4.0 methodologies, Industry 4.0 would not be a challenge. However, no research has been conducted in this regard. As a result, the hole must be addressed by doing Industry 4.0 research. 4.0 education Because most operations will be handled by automation shortly, the difficulties of Ir 4.0 must be solved. As a result, appropriate understanding or digital learning of industrial activities before or even during engagement may positively impact the learners.

3. Methodology

In order to evaluate the findings of the study, this article analysed the evaluations on technological usage in English language learning utilising education 4.0 among Engineering students in Telangana state. A route map of the research model is shown below.

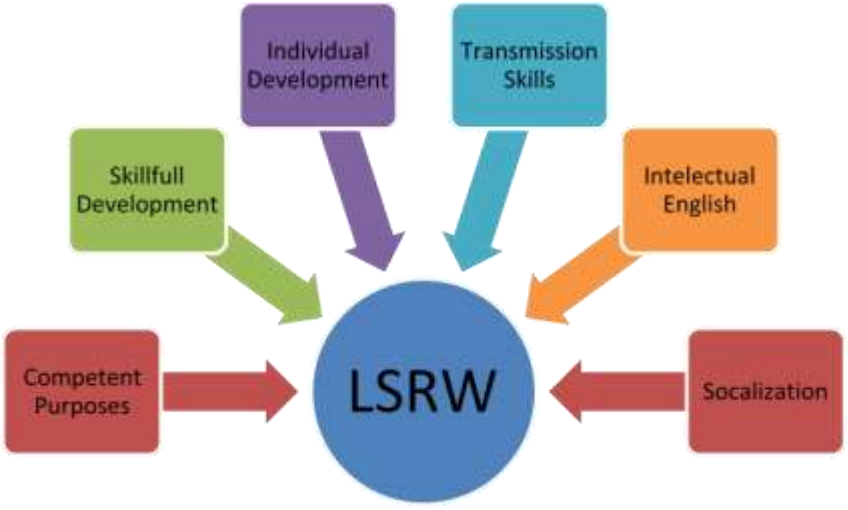

Figure 1. English Language Learning using Education 4.0

The following proposed conceptual model is tested using SPSS software to measure the reliability and fit of the model index. The Baysan estimate is used to assess the primary data acquired for the research as a basic parameter of Converge Statistics ('CS'). the second year, The path described above shows the causal relationships among variables. Professional ambitions, academic advances, personal achievements, professional communication skills, academic English, verbal interaction are communication principles. LSRW (listening, speaking, reading, writing) is the determining factor and has a negative or positive effect on the overall satisfaction of job orientation, entrepreneurial activities, placement preparation, and global skills.

On that premise, the purpose of this research is to investigate the abilities and experience that young engineers require to be prepared for the Education 4.0.0 background. A questionnaire was specifically devised to assess this condition. Students participating in the first and second years can obtain undergrad credentials from three educational institutes. The answers collected gave an overview of the current status at these three universities, with some fundamental insights on education in engineering.

Hypotheses of the study are:

H_1: There is a noteworthy impact of Competent Purposes on LSRW.

H_2: There is an important impact of Skillful Developments on LSRW.

H_3: There is a significant impact of Individual Developments on LSRW.

H_4: There is a major impact of Transmission Communication Skills on LSRW.

H_5: There is a significant impact of Intellectual English on LSRW.

H_6: There is a significant impact of Socialization Communications on LSRW.

H_7: There is a significant impact of LSRW on overall English Language Learning.

H_8: There is a significant impact of English learning language using education 4.0.

Results, Analysis and Interpretation

Table 1. Descriptive Statistics Analysis of Sample Size

Demographic Variables	Frequency (N=300)	Percentage (100%)	Demographic variables	Frequency (N=300)	Percentage (100%)
Gender			Department		
Male	142	48	Civil	9	3.0
Female	158	52	Arch	36	12.0
Year			Mechanical	30	10.0
I year	40	13.3	EEE	21	7.0
II year	28	9.3	EIE	75	25.0
III year	126	42.0	Biotech	3	1.0
IV year	106	35.3	Auto	54	18.0
			CSE	6	2.0
			IT	33	11.0
			Biomedical	33	11.0

Male participants made up 48 percent of the sample size, while the remaining 52 percent were females. Although 70 % of the participants were in their third year of study, they were in their first, second or fourth year. In addition, 25 % of the participants were EIE students, 18 % were Auto, and the remaining were Legal, Arch, Mechanical, EEE, EIE, Biotech, Auto, Biomedical departments.

Table 2. Model Fit Statistics

Model fit statistics	Suggested value	Actual value
are/ df	≤ 5.00	2.96
Goodness of Fit Index (GFI)	≥ 0.80	0.815
Adjusted Goodness of fit Index (AGFI)	≥ 0.90	0.920
Comparative Fit Index (CFI)	≥ 0.90	0.912
Root means square of approximate (RMSEA)	≤ 0.08	0.059

Model fit indices: The Bentler and Bonnet (1980) analysis showed that the Root Mean Square Error of Approximation (RMSEA), which is below 0.08, seems to have a good fit, but lesser than 0.05, has a better fit, will confirm the model fit. The research conducted by Joreskog and Sorbom (1988) indicated that the Goodness of Fit Index (GFI) must be above 0.8 and the Adjusted Good-of-fit Index (AGFI) must be above 0.9. A Bentler(1990) analysis proposed that it should be greater than 0.9 for CFI (Comparative Fit Index). Wheaton (1987), as well as Hair et al. (1998), suggested that chi-square should be < 5 to be appropriate. A chi-square value of 2.96 is important at the $p<0.001$ level in the model estimation performance. The AGFI (0.920) and CFI (0.912) values indicate an acceptable match between the research framework and the study's findings, The GFI of 0.815 and RMSEA of 0.059 showed fine fit. This indicates that the data set available fits slightly into the proposed structural model.

LSRW is directly influenced by modern science, professional goals, competent breakthroughs, individual developments, communication proficiency, intellectual English, and social interactions, contributing to English language learning that positively impacts engineering student satisfaction.

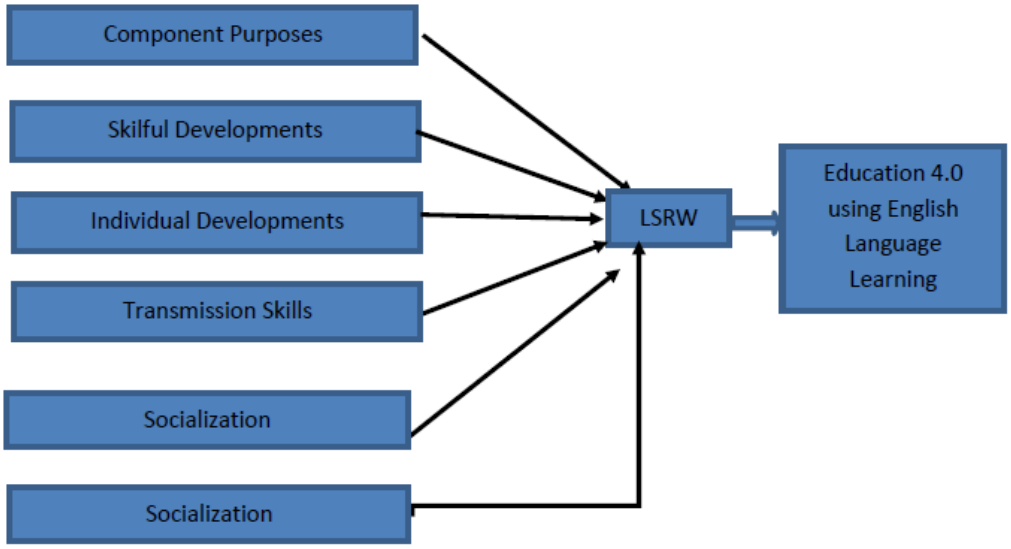

Figure 2. Impact of Engineering Students' using English language learning in Education 4.0

Table 3. Empirical Results of the Proposed Model

Structural paths			Estimate	S.E.	C.R.	P	Hypothesis
Competent Purposes	→	LSRW	0.266	0.121	2.203	0.028	Yes
Skillful Developments	→	LSRW	0.290	0.090	-2.528	0.011	Yes
Individual Developments	→	LSRW	0.078	0.096	0.796	0.426	Yes
Transmission Skills	→	LSRW	-0.077	0.129	-0.604	0.546	No
Intellectual English	→	LSRW	0.353	0.117	3.031	0.002	Yes
Socialisation	→	LSRW	0.276	0.088	3.031	0.002	Yes
LSRW	→	English Language learning using Education 4.0	0.820	0.091	9.016	***	Yes

The weight of regression reflects the degree of correlation between constructs and variables manifested. Competent reasons (0.266), Skillful patterns (0.290), Human trends (0.078), Transmission abilities (-0.077), Intellectual English (0.353) and socialization (0.276) affected LSRW. However, competent communication skills have positive regression weights on LSRW and the remaining five exogenous variables.

In identifying the overall satisfaction of English language proficiency, these findings are significant. LSRW (0.820) continues to have a significant effect on English language learning using Education 4.0. It contributes to increased use of the English language in self-learning, career aspirations, creativity, job preparation, and global competencies for the advancement of students. Professional communication in English generates satisfaction to have a noteworthy outcome for this research and improvement in job opportunities as well the inter-correlation between the dimensions of competent reasons, skillful developments, individual advancements, communication skills for transmission, intelligent English, and socialization is positively related to each other.

4. Result and Discussion of the Study

This paper is based on statistical analysis to verify the technological communication of the English language using Education 4.0.0 through the mediation impact of LSRW through English language learning. The study revealed the variables influencing the use of Education 4.0 by LSRW and students' accomplishments using English. Competent ambitions, professional improvements, individual innovations, transmission abilities, intellectual English, and socialization are the key factors that have paved the way for this. Competent purposes (0.266), intellectual innovations (0.290), individual developments (0.078), Transmission skills (-0.077), Intellectual English (0.353) and

socialization (0.276) are the degree of partnership between LSRW using Education 4.0 and the variables. The usage of Education 4.0 by LSRW significantly influences overall English language learning achievements. The weight of regression reflects the correlation degree as 0.820.

As a result, it shows that except for competent communication skills, the most influential variables such as academic developments, personal developments, academic English, social communications, and professional purposes reflect favorably on the mediating variable LSRW using Education 4.0.

Based on the analysis, engineering students from 3 districts of Telangana need to outfit themselves with English language learning using Education 4.0. for their potential career prospects. The growth of professional communication skills will lead them to better career lives. Correcting their lack of professional communication skills is in their best interests. This will allow them to shine in the traditional formal route.

5. Conclusion

The research is based on the quantitative approach of the questionnaire provided. The findings and discussion of the latest research subject to learn using the English language in education 4.0 from industry 4.0 are reviewed by implementing this literature. In education 4.0 using English language learning, there are many study possibilities for the studies that occur inside these differences and the usage of English language learning in education 4.0 is interrelated. In future studies, to implement interconnecting research in these fields can be answered, and the answers for the above questions can be considered by the language of English learning using education 4.0 and to conduct interlinking research in these fields. So there are some suggestions to make certain that future research can be performed in these interconnections of the language of English. The real scenario of education 4.0 and its challenges will be illuminated in this sector.

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