Effectiveness of Social Inquiry Model in Promoting Global Citizenship Education With Science Teaching at Secondary Level

Swati Kumari*
Banasthali University,
Banasthali, India

Sapna Sharma
Banasthali University,
Banasthali, India

Abstract: Neoteric lifestyles have brought great damage to nature and the environment. Education in the wider sense will play an integral role in bringing the change required in distant ways. Science education with proper understanding can act as a vector for the promotion of inter-connectivity globally. With the knowledge of Global Citizenship Education (GCE), students will learn to respect their thoughts while taking account of others points of view. The field of GCE is not restricted to any single subject. It is meant for all areas of the curriculum. This research work investigated the impacts of the gender of students within global citizenship education with science teaching and investigated any difference in learning outcomes of students belonging to different groups based on their gender. The nature of the study is experimental. The samling technique used is a mix of random and purposive sampling. The mixed-method research design has been adopted for data collection, i.e., qualitative and quantitative methods will be used within the single study. Findings revealed the existence of differences in pre and post-test marks, indicating no difference in knowledge-based, value-based, and citizenship-based outcomes of boys and girls. It means that the GCE course is effective for both boys and girls, irrespective of gender. Students accepted that curriculum promoting global citizenship has been absent from the spotlight.

Keywords: *GCE, knowledge based learning, value based learning, citizenship based learning outcomes*

INTRODUCTION

Citizenship prescribes a specific line of activity for all to follow. One should always remember that duties differ in different situations and at different times. The immediate duty has always to be appreciated and performed. The origin of GCE is traced to the middle of last century. But it has been found that even at the times of Aryan between 1500 BC-2000 BC the idea of GCE was originated. The love of all mankind was central to the Vedic philosophy. The values of Indian life enshrined in Vedic culture literature- Vasudheiva kutumbakam, Sarvey Bhavantu Sukhinah, etc. were present even at that time. Three different terms used in last decades to fulfil similar aims like GCE are the world studies which have taken place in the twentieth century another is International Education promoted after World War II and then Global Education and Education for interdependence.

There are multiple interpretations for the term GCE. Despite these multiple interpretations there is a common understanding which refers to a sense of belonging to a broader community and common humanity based on universal values and respect for diversity and pluralism. The values of global citizenship are transferred in individuals through different forms of education: formal, informal and non-formal. In order to measure GCE, it is important to pay attention

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*Correspondence concerning this article should be addressed Swati Kumari, Banasthali University, Banasthali, India. E-mail: singh-swati.h@gmail.com

on Education system together with the outcomes that are achieved by participating in this system. Further outcomes are categorized under these categories:

i Knowledge based outcomes - it provides deeper understanding and involves development of knowledge, concepts and skills.

ii Value based outcomes - it comprises of what people valued or found to be important. It evolves students skills of social and personal relationship.

iii Citizenship based outcomes - this focuses on issues young people identified and those they wanted to see changed. To measure this one can ask students a value based questions alongside an issue based question.

This will generate a strong sense of community engagement which further trigger many so what and Now what types of social inquiry questions forming ground for discussions and validating different viewpoints generated under the roof of GCE.

Science and Values of GCE

It was through the spirit and method of science that man has been able to explore, understand and conquer the forces of nature. Science teaching is an extremely demanding occupation. Science learning can happen with a range of different course of action and for a number of different purposes. Everyone is different and this is equally applicable in the classrooms also where students bring different prepossession, different aptitudes, acquaintance, perceptive and expertise into science education. There is extensive evidence that children have a wide range of preconceptions on notions such as Burning, Energy, Force, Heat, Pressure and indeed most of the concepts that are the concern of the Secondary science curriculum. Secondary Education is the most deciding stage in the educational pecking order as it equips the learners for Higher Education and also the cosmos of drudge. Trading a life with dignity and outlive the basic hardship, Secondary Education is the portal for plenteousness, for revolutionize the economy as well as in establishing social justice. It is argued that scientific acquaintances and understanding plays important role in determining action and choices in this globalized world.

Rationale of the Study

In present day situation upbringing of children presents a more complicated set of challenges than were faced by parents in the past. Parents want their children to be well prepared for facing the challenges of globally competitive world (Hock-Eam & Yeok, 2017). One may suggest that students have to recognise the wonderful opportunities that are created by diversity and the richness of culture across our planet(Skoric & Kupresanin, 2018). Kishino and Takahashi (2019) examined how the characteristics of global citizenship develops in undergraduate arts students after studying abroad. The study is based upon survey method using cross-sectional correlation design. Four hundred sixteen students above the age of eighteen were participated in online questionnaire. Findings revealed that contrary to the expectations students who are studying abroad shows less potential to develop global citizenship characteristics as they are already struggling to their identities and trying to overcome the cultural shock instead students who are studying in an university which foster the GCE tends to develop the traits more easily and effectively. Roux (2019) examined perception of ten Mexican English language university teachers on GCE. The study is based upon interviews and questionnaire. Findings revealed that seven out of ten teachers were unaware about the term GCE. Those who are aware suggest that it should be teach across the curriculum. Teacher could discuss topics of strong impacts and serious issues with their students and for this language is the simplest way. If one is competent in more than two languages it means he or she understands more than one culture. With language individuals form, comprehend and show their feelings, emotions and values. But majority of teachers found GCE non viable in their program and universities. Most of the teachers agreed that majority of them are not prepared to deal with global issues in class and for developing this they need three basic things i.e., administration support, training of teachers and implementation strategies. Buchanan, Burridge, and Chodkiewicz (2018) studied how to maintain GCE in Australian schools. Since 1960 Australian schools are focusing on GCE, recently steps were also taken in advancing it. Findings revealed that for maintaining GCE it is most important for teachers to follow a specific pedagogy and to keep them updated. Recently value based global education pedagogy has been applied by few instructors. It is always central to teach interconnectedness, global issues and global connections. Findings also suggest schools should adopt variety of teaching and learning method to teach GCE. In Australian curriculum there are so many opportunities for GCE, recently they started project named ACARA

which is designed to reach out to the world beyond Australian shores. Subjects like History, Civics, Geography offers specific designed courses for GCE. The Civics and Citizenship subject refers to participation as global citizens by increasing students understanding about diversity. Osiadacz (2018) revealed biggest problem with GCE is that there is not a single evaluation tool to decide which practice is more relevant for global citizenship. Grabowski, Wearing, Lyons, Tarrant, and Landon (2017) explained studying abroad means exposure to various cultures and cultural differences and these variations play major role in GCE. This exposure also results in development of tolerance and acceptance in students. There are various studies that support the fact that with GCE students show an increased attentiveness in class, greater ownership of their learning and a greater capacity to work independently. Schutte, Kamans, Wolfensberger, and Veugelers (2017) investigated students roles as citizens of world, the study was conducted on 25 undergraduate students of Netherland. The study is a designed GCE coursework of 112 hours based on mixed method approach. Findings revealed that it has a positive impact on students learning. A more extended form of course is needed for a deeper understanding as students with higher abilities shown much more interest than average ones. Smaller sample size and absence of control groups are major drawbacks of the study. Pittman et al. (2017) explored Global Citizenship Theories to Advance Educational, Social, Economic and Environmental Justice. Author examined theories of GCE under three lenses one is political second is social and third is educational. Under political viewpoint people suggest GCE as an essential political concept which promotes political relationships between co-citizens while for social viewpoint it majorly deals with the content of social rights and organization and developed from the conjuncture of social and cultural conditions. But there is a big gap to implement the same with subject teaching in schools and now this is the need of the hour to decode this practice in the field of science education as future of society in the global knowledge and information age is increasingly relying on the future of science education. Karaarslan and Teksöz (2016) studied the required competencies of science teachers and educators in creating better sustainable world. Findings revealed that it is important to create citizens who are able to critically analyse the problem of environment and society. According to the researcher technical and industrial development has influenced science education so now it is the responsibility of science education to create globally sound and informed citizens. Gap analysis was performed for identifying research questions and the study is basic qualitative research design. Content analysis was done to analyse interview data. Findings revealed that for modifying the competencies of science teachers and educators UNECE guidelines were followed. Apart from old categories like subject matter knowledge, problem solving skills etc new categories has also emerged for instance affective components, skills to plan holistic ways of teaching and so on. Further just having the subject knowledge is not sufficient for teachers and a teacher should know about culture, society and economy as well.

Jayshree (2015) studied role of Science education in bringing globalization and commercialisation. On one hand science and technologies brought growth for us and on the other hand it results in degrading harmonious life of human beings. Findings suggest that with advancement of science and technology values, morals and ethics are lagging behind. With parents teachers should also pay attention in making students into responsible and globally sound citizens. For this every subject should contribute in some value education. All the achievements and advancement will be meaningless without a sustainable world.

Rustiadi (2015) studied how education helps in equipping humans to cope up with ever changing world. The study is about city of Bandung, Indonesia. The city faces severe problem in the system of education as the whole attention here is on creating infrastructure on the stake of developing human resources. Findings revealed that it is disheartening to see that education system in Indonesia is not motivating new generation. The focus is on rote learning and good marks. In PISA 2012 Indonesia was ranked at bottom for maths and science. Students are totally ignorant about creative and cultural education. Government should realize that human growth and happiness are positively related to better opportunity for citizens. Findings also suggest about collecting more thorough and wide-ranging resources to make learning more effective. The development of the industries needs to be supported with development in educational process to ensure the sustainability of not only economic development but also local culture and identity.

In normal setting every subject should contribute to GCE in an inclusive form instead of an exclusive way so that students found it relevant to their life. After going through educational research done in the area of GCE researcher found researches in the area of instructional design, global citizenship competencies for students and teachers, science for humanism, learning environment, challenges for GCE, curriculum reforms, international education, education for sustainability, multilinguistic and cross cultural education. These studies also revealed that teaching become more effective, joyous and independent.

Objectives of the Study

In present study following objectives are formulated:

1. To identify GCE related concepts that are present in NCERT science textbook for class 9.

2. To develop lesson plan based on Social Inquiry Model (SIM) for identified GCE related concepts.

3. To study the effectiveness of SIM in GCE.

   - To study the effectiveness of SIM in Knowledge based outcomes with reference to gender of students.
   - To study the effectiveness of SIM in Value based outcomes with reference to gender of students.
   - To study the effectiveness of SIM in Citizenship based outcomes with reference to gender of students.

Research Questions

1. Does SIM is effective in promoting GCE?

2. What are the impacts of gender of students on learning outcomes for GCE? Is there any difference in learning outcomes of male and female students?

HYPOTHESES

In this study following research hypotheses are formulated on the basis of above mentioned objectives.

H 1: *GCE related concepts could be identified in NCERT Science Textbook for class 9.*

H 2: *The lesson plan based on SIM could be developed for GCE.*

H 3: *There is significant difference between the achievement scores of pre-test and post-test of GCE; (a) There is significant difference between the achievement scores of pre-test and post-test of knowledge based GCE with reference to gender of students, (b) There is significant difference between the achievement scores of pre-test and post-test of value based GCE with reference to gender of students and (c) There is significant difference between the achievement scores of pre-test and post-test of citizenship based GCE with reference to gender of students.*

RESEARCH METHODOLOGY

The nature of the study is experimental under which the one-group, pretest-posttest design will be followed which provides some improvement over the first, for the effects of the treatment are judged by the differences between the pretest and posttest scores.

X1 —————— T —————- X2
Pre-test —— Treatment —— Post-test

Variables Used in this Study

All research projects are based around variables. We may define them as any characteristics or attribute of an individual, group, educational system, etc. that can take different values.

Independent variables: These are manipulated by the researcher or observed by the researcher so that their values can be related to that of the dependent variable. In this study Social-inquiry model of science teaching is independent variable. For objective 3 gender and background of students also serve as an independent variable in this study.

Dependent variables: That factor which is observed and measured to determine the effect of the independent variable. Here coordinated science which means contents of physics, chemistry and biology at secondary level plus outcomes for GCE is dependent variable. In present study students achievement in GCE and their perception towards SIM for developing GCE are identified as dependent variables.

Population

It is the group of interest to the researcher, the group to which the results of the study will ideally generalise. The population of present study comprises of all the students of class 9 studying in C.B.S.E. affiliated schools of North Chhotanagpur of Jharkhand state and all the science text books recommended for students of class 9.

Sample and Sampling

Jharkhand state is divided into 5 administrative divisions. The study will adopt two stage sampling procedure. In this present study the division of North Chhotanagpur is selected purposively as it has large number of districts currently receiving funds from the Backward Regions Grant Fund Programme (BRGF) and it is worth of finding the obstacles and effectiveness of program that aims to develop qualities for GCE in this environment where too much emphasis is given on local perspective. Division of North Chhotanagpur has 7 districts and out of these one district will be selected randomly and further CBSE Co-educational school having students from city and out skirts of city will be selected. Then matching type sampling will be adopted to minimize the impact of confounding variables. Finally a small group of male and female students (approx. 60) of class 9 from selected schools will be selected as a sample for this study.

Tools for the Study

The mixed method research design has been adopted for data collection, i.e., both qualitative and quantitative methods will be used within the single study. A tool serves as an important purpose in empirical research by providing a good basis to the research for collecting the data. In order to collect the data following tools will be used.

1. GCE Achievement test, to measure three important outcomes of GCE i.e., knowledge based outcomes, value based outcomes and citizenship based outcomes.
2. A perception scale will be devised for the students, to record their responses towards adopting SIM in promoting GCE at secondary level science education.

Source of Data

In this study data will be collected from primary sources. All the students of class 9 and NCERT text book of Science for class 9 will be source of data.

Nature of Data

The nature of data collected in this study will include qualitative as well as quantitative data.

Research Procedure

- First step is to analyse the content of NCERT Science textbook for identification of concepts related to GCE. Then for the development of GCE in science teaching at secondary level with respect to social inquiry model, lesson plan will be deigned accordingly. For each concepts two parallel GCE achievement test will be prepared.
- Next step is to identify the school. After that the administrators of the schools will be informed about the purpose of the study and will seek permission from the authority to conduct the research.
- After this step researcher will administer pre achievement test on selected students and after this lesson plan based on SIM will be implemented following this treatment post achievement test will be administered.
- The data will be collected through administration of self- made global citizenship achievement test by following pre-test, treatment and post-test on daily basis separately for each concept. After conducting the treatment, perception scale will be administered to record the students responses. Then the collected data will be organized, classified and statistically analysed to draw the conclusion based upon research problems.

After drawing definite and well-formulated conclusion, recommendations will be made to solve or relieve the problem.

RESULTS AND DISCUSSION

The mixed method research design has been adopted for data collection, i.e., both qualitative and quantitative methods will be used within the single study. The nature of data collected in this study will include qualitative as well as quantitative data. In this study data will be collected from primary sources. All the students of class 9 and NCERT text book of Science for class 9 will be source of data. one-group, pretest-posttest design will be followed which provides some improvement over the first, for the effects of the treatment are judged by the differences between the pretest and posttest scores.

H 4a (Main hypothesis): *There is significant difference between the achievement scores of pre-test and post-test of GCE based lesson in students.*

H 4b (Sub hypothesis): *there is significant difference between the achievement scores of pre-test and post-test of knowledge based, value based and citizenship based GCE outcomes*

H 4c (Null hypothesis): *There is no significant difference between the mean scores of pre-test and post-test of knowledge based, value based and citizenship based GCE outcomes.*

Table 1 Shows the difference between the mean score of pre-test and post-test of knowledge based, value based and citizenship based GCE outcomes.

Table 1 *Mean Value for the Level of Anxiety*

Dimensions	Pre-post Analysis						Df	t Value	p Value	Significance Level
	Grade 9									
	Pre Test			Post Test						
	N	Mean	SD	N	Mean	SD				
Knowledge Based Outcomes	65	2.65	1.10	65	8.34	1.05	128	19.32	0.00	Significant
Value Based Outcomes	65	2.52	1.03	65	9.11	0.85	128	23.29	0.00	Significant
Citizenship Based Outcomes	65	1.54	1.35	65	8.89	0.90	128	23.45	0.00	Significant

Table 2 shows that *t* value for knowledge based, value based and citizenship based outcomes are 19.32, 23.29 and 23.45 respectively which are significant at 0.05 levels.

For knowledge based outcomes the mean score of pre-test is 2.65 and the mean score of post-test is 8.34. It indicates achievement with respect to pre-test score which significantly differs from that of post-test scores. In this context the null hypothesis that there is no significant difference between the mean scores of pre and post achievement test for the concept "Diversity in living organisms" is not accepted and the research hypothesis is accepted.

For Value based outcomes the mean score of pre-test is 2.52 and the mean score of post-test is 9.11. It indicates achievement with respect to pre-test score which significantly differs from that of post-test scores. In this context the null hypothesis that "there is no significant difference between the mean scores of pre and post achievement test for the concept Diversity in living organisms" is not accepted and the research hypothesis is accepted.

For Citizenship based outcomes the mean score of pre-test is 1.54 and the mean score of post-test is 8.89. It indicates achievement with respect to pre-test score which significantly differs from that of post-test scores. In this context the null hypothesis that "there is no significant difference between the mean scores of pre and post achievement test for the concept Diversity in living organisms" is not accepted and the research hypothesis is accepted.

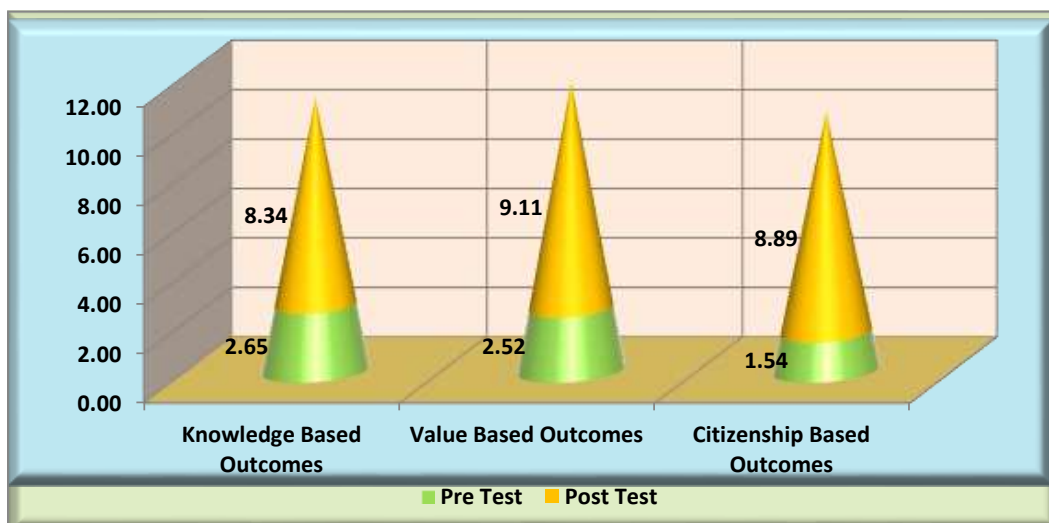The results indicate that achievement is significantly affected by SIM in promotingGCE with science teaching.

Figure 1 *Graphical interpretation*

Main Hypothesis (Gender Wise)

H 5a (Main hypothesis): *There is significant difference between the achievement scores of pre-test and post-test of knowledge based, value based and citizenship based GCE with reference to gender.*

H 5b (Sub hypothesis): *]There is significant difference between the achievement scores of pre-test and post-test of boys in knowledge based, value based and citizenship based GCE outcomes.*

H 5c (Null hypothesis): *There is no significant difference between the mean scores of pre-test and post-test of boys in knowledge based, value based and citizenship based GCE outcomes.*

Table 2 *The Difference Between the Mean Score of Pre-Test and Post-Test of Boys in Knowledge Based, Value Based and Citizenship Based Gce Outcomes*

Concept 1 (Pre-post Analysis: Gender Wise)									
Dimensions	Groups (Boys)						*Df*	*t* Value	*p* Value	Significance
	Pre Test			Post Test						Level
	N	Mean	*SD*	*N*	Mean	*SD*				
Knowledge Based Outcomes	35	2.83	1.15	35	8.43	1.12	68	13.40	0.00	Significant
Value Based Outcomes	35	2.37	1.06	35	9.06	0.87	68	16.24	0.00	Significant
Citizenship Based Outcomes	35	1.80	1.47	35	8.83	0.86	68	16.09	0.00	Significant

Table 3 shows that *t* value for knowledge based, value based and citizenship based outcomes are 13.40, 16.24 and 16.09 respectively which are significant at 0.05 levels.

For knowledge based outcomes the mean score of pre-test is 2.83 and the mean score of post-test is 8.43. For Value based outcomes the mean score of pre test is 2.37 and the mean score of post test is 9.06. For Citizenship based outcomes the mean score of pre-test is 1.80 and the mean score of post test is 8.83.

It indicates achievement with respect to pre-test score which significantly differs from that of post-test scores. In this context the null hypothesis that there is no significant difference between the mean scores of pre-test and post-test of boys in knowledge based, value based and citizenship based GCE outcomes is not accepted and the research hypothesis is accepted. This implies that achievement in boys is significantly affected by SIM in promotingGCE with science teaching.
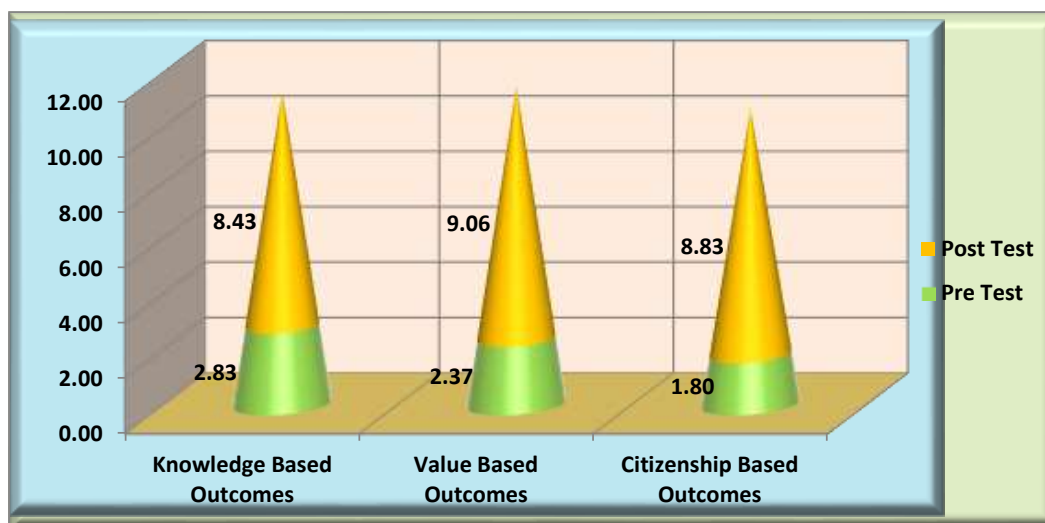

Figure 2 *Graphical interpretation*

H 6a (Sub hypothesis): *There is significant difference between the achievement scores of pre-test and post-test of girls in knowledge based, value based and citizenship based GCE outcomes.*

H 6b (Null hypothesis): *There is no significant difference between the mean scores of pre-test and post-test of girls in knowledge based, value based and citizenship based GCE outcomes.*

Table 3 Shows the difference between the mean score of pre-test and post-test of girls in knowledge based, value based and citizenship based GCE outcomes.

Table 3 *The Difference Between the Mean Score of Pre-Test and Post-Test of Girls in Knowledge Based, Value Based and Citizenship Based Gce Outcomes*

Concept 1 (Pre-post Analysis: Gender Wise)									
Dimensions	Groups (Girls)						*Df*	*t* Value	*p* Value	Significance Level
	Pre Test			Post Test						
	N	Mean	*SD*	*N*	Mean	*SD*				
Knowledge Based Outcomes	30	2.43	1.01	30	8.23	0.97	58	13.83	0.00	Significant
Value Based Outcomes	30	2.70	0.99	30	9.17	0.83	58	16.72	0.00	Significant
Citizenship Based Outcomes	30	1.23	1.14	30	8.97	0.96	58	17.72	0.00	Significant

Table 3 shows that *t* value for knowledge based, value based and citizenship based outcomes are 13.83, 16.72 and 17.72 respectively which are significant at 0.05 levels.

It indicates achievement with respect to pre-test score which significantly differs from that of post-test scores. In this context the null hypothesis that there is no significant difference between the mean scores of pre-test and post-test of girls in knowledge based, value based and citizenship based GCE outcomes is not accepted and the research hypothesis is accepted. This implies that achievement in girls is significantly affected by SIM in promoting GCE with science teaching.
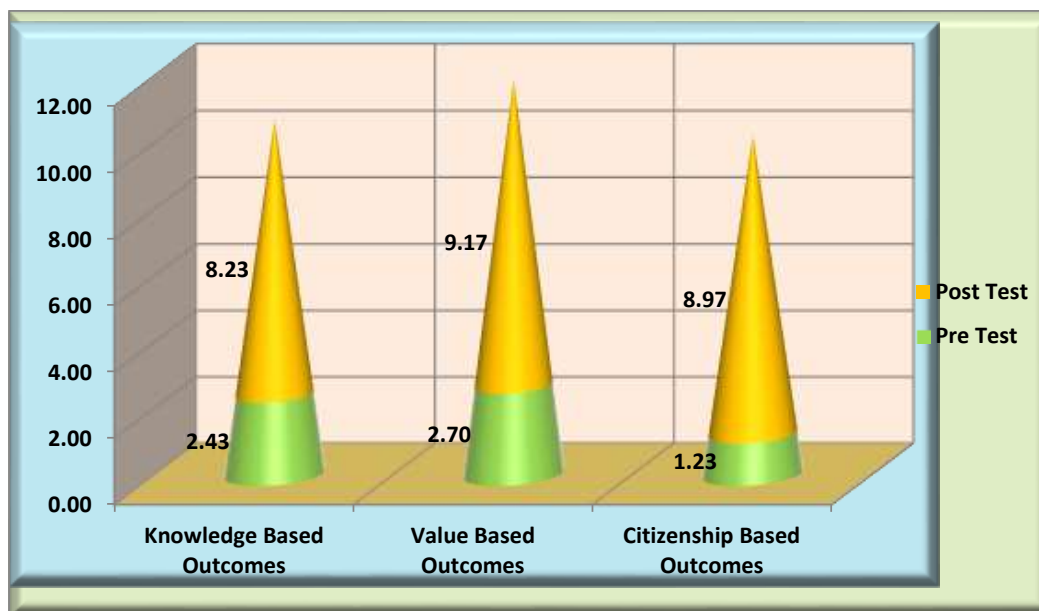

Figure 3 *Graphical interpretation*

CONCLUSION AND IMPLICATIONS

It is evident from the findings that GCE based lesson plans are effective in developing global citizen competencies in students. Findings revealed that there is no difference in knowledge based, value based and citizenship based outcomes of boys and girls. It means that GCE course is effective for both the boys and girls irrespective of gender. The study also indicated that international organisations like UNESCO and EU are also working to establish GCE as a dominant discourse. In preparing students to be a global citizen there is still much work to be done. Before implementing GCE in schools it requires teacher educators and teacher preparation programs to engage in critical examination and conversations on the complexities and possibilities ofGCE.

The researcher found that lesson plan based on SIM helps in effective GCE learning by creating right atmosphere for particular type of learning. It is observed that if teachers will stick to teacher-centred perspective they are less

frequent to use inquiry based learning. Adopting inquiry based learning requires cognitive skills to lead students into deep discussions and higher order thinking and active learning. For better implementation it is necessary to plan expected challenges well in advance. There is a need to follow student-centred constructivist approach for development of cognition skills. It is observed that person with developed inter-cultural competence will automatically act as a global citizen. It is found that GCE under SIM helps in creating informed citizens who are responsible for their actions. They are aware about risks of damaging the environment. GCE introduced in this study is a way to address global competencies in students with different gender and background. Teaching of science and GCE were researched because of contribution of science and technologies in the rise of globalization. It is said that globalisation is expected to continue or even grow with the changing time. Science with global citizenship approach of learning teaches students to explore meaning within various contexts. The concern for any issues is always well balanced with local as well as global concerns. Global citizenship education is not limited to themes such as civics, human rights, gender equality and peace education but it is well rehearsed and found in other subjects as well thus forming a ground for making efforts from all subject teacher for its practice and teaching. It is present in everyday lives of youth of present era. Foreigner students to any place tend to have a strong sense of globalised identities. Since the exposure to them is much greater than to local students. It is advisable to accept GCE as an integrated subject instead of teaching it as a separate one.

There are several issues with implementing GCE at school level as many teachers still not able to accept it at the heart of teaching. A discussion should be carried on that GCE is linked to each subject and is a part of everyday school life. Guided debates about the meanings and especially about the objectives of GCE can contributes towards the planning of actions to be taken.

Educational Implications

The educational implications for present study are not difficult to discern. The subject of study is of much importance in the present conditions of teaching learning process.

- For teachers - many teachers reported lack of confidence to teach current controversial issues. Global citizenship education can help them acquiring the skills and knowledge needed to promote sustainable lifestyle. GCE aims at building the capacity of teachers as teachers are the one who are expected to prepare their students to be productive and responsible. UNESCO (2018) reported that lack of teacher's knowledge is one of the important barriers in implementing GCE. UNESCO Asia-Pacific Regional Bureau for Education in Bangkok, Thailand, conducted a project to enhance the quality of teacher's training to be sure that they will perform well in their job. Teachers found it difficult to identify topics related with GCE. This agrees with study of Cho (2016) mentioning GCE topics are difficult to identify since they are scattered throughout the curriculum. It is of much importance to create a learning atmosphere where teachers can learn and explore components of GCE through training.

- For community - GCE helps in promoting understanding and respect for diverse cultures. According to UNESCO institute for statistics it was reported that every year 246 million students faced bullying due to physical appearance, cultural background, language and nationality. Themes ofGCE must be introduced in school curriculum so that it will foster a sense of belongingness to common humanity. When the World is changing rapidly, community play direct role in strengthening students capabilities by modelling values of respect and trust. Implications of GCE can lead to more sustainable world by challenging injustice and inequality prevalent in societies.

- For students -it should be remembered that effective learning is very necessary for students. Teachers are facing difficulties in identifying GCE related topics in the curriculum it means students are not getting desired exposure of these contents in regular classes. Therefore it becomes mandatory to introduce GCE for them to be a responsible citizen of world. In this highly connected, inter dependent world students are expected to engage in real and meaningful learning. This can be achieved by implementing GCE from very beginning of school life resulting in development of sense of responsibility and knowledge of diverse people around the world.

- For educational policy makers - the authorities can use the result of the study to understand importance of GCE to develop programs and training for teachers. They can work upon incorporation of GCE in regular classes meant for students. It is found that majority of students are neither aware about political issues nor they care about international relations. The study presented that application of GCE reinforces students knowledge about world's issues and help them to be tolerant, respectful towards others cultures and critical thinkers.

Suggestion for Future Research

No study is final in any area irrespective of the field of research. Thus this research does not claim that the findings of the study are absolute and final. The study recommends necessity of researches to understand GCE.

1. Future studies could uncover integration of GCE with different subjects and grades.
2. Studies can also be done on challenges faced by teachers, students and other authorities while implementing it. The study would then provide better overall understanding of the idea.
3. Further researches can identify all the influential factors that determine achievement of GCE and competencies required for the same.
4. A study of development of GCE based curriculum can be done.
5. A comparative study of GCE can be studied with reference to different cultural settings.
6. Similar study can be done at different academic levels.
7. Future researches can also probe real classroom happenings of GCE in formal and non formal education in India.
8. Observation of GCE classes in different subjects and interviews with students could provide better understandings for GCE.
9. Current status of GCE awareness could be explored for higher education systems especially in universities.
10. Analysis of curriculum and policies supporting GCE could be performed for different levels.

Delimitations of the study

The delimitations of present study are:
- The study will be delimited to secondary stage of science education only.
- The study will be delimited to only one district division of Jharkhand State.
- The present study will deal with only GCE related concepts of science present in NCERT text book of class 9.

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