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EFFECTIVENESS OF E-CONTENT LEARNING MATERIAL IN TERMS OF KNOWLEDGE ATTAINMENT OF UNDERGRADUATE STUDENTS ON SUSTAINABLE DEVELOPMENT

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ABSTRACT

In the present study an attempt has been made to find out the effectiveness of e-content in terms of knowledge attainment of undergraduate students on sustainable development. A sample of 80 undergraduate students was selected randomly. The non-equivalent control group quasi experimental design has been used in this research study. The data was collected by administering Knowledge Attainment Test and attitude towards environmental management on sustainable development. The obtained data was analysed by using ANCOVA as a statistical techniques. The obtained results show that the study of e-content is significantly in enhancing the knowledge attainment and change in the attitude of undergraduate students on sustainable development.

KEYWORDS: e-content, Sustainable Development, Knowledge, Effectiveness, e-learning, unsustainability.

INTRODUCTION

With the rapid progress of information and communication technology and the great development of internet e-learning as an idea and a mode of learning, has been favoured by more and more people. This new learning approach has greatly highlighted the subjectivity and initiative of learners. On one hand, e-learners could consciously think how to adjust themselves with the direction and progress of their own learning, develop their cognitive level and optimize their thinking ability and structure based on their own choice, cognitive level, structure and degree. On the other hand, the process that e-learners gradually update knowledge and get more information would be perverse incentives for reflection.

E-learning can be effectively used for educational purposes because of following reasons:

- Improved motivation and engagement.
- Greater independence and personalised learning.
- Improved critical thinking and development of multi-literacy.
- Greater access to information, resources and experts.
- Greater opportunities for collaboration in wide contexts, including international ones. (http://spotswoodcollege.school.nz/byod/)
- Advances in the autonomy of learners.
- Enhancement in the learners' creativity.

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- Students explore new learning environments by overcoming barriers of distance and time.
- Facilitate shared learning by enabling students to join or create communities of learners that extend well beyond the classroom.(http://www.simonjohnmarshall.com/?p=79).
- Assistance in the creation of supportive learning environments by offering resources that takes account of individual, cultural, or developmental differences.
- Enhance opportunities to learn by offering students virtual experiences and tools that save time, allowing them to take their learning further. (http://teswell.blogspot.com/2009/08/discussion-forums.html)
- e-learning sessions are available 24x7. Learners are not bound to a specific day or time to physically attend classes. They can also pause learning sessions at their convenience. (https://phdessay.com/ict-in-language-teaching/)
- Knowledge can be shared across borders, allowing students to attend courses across physical, political, and economic boundaries.
- Recognized experts have the opportunity of making information available internationally, to anyone interested at minimum costs. (https://www.scribd.com/document/20895810/E-Learning)

Information and communications technologies, which afford learners, access to up- to-date information as and when they need them, and the opportunity to discuss this information with their peers and teachers at their convenience. This is becoming increasingly affordable and palatable with a wide range of applications and computer conferencing technologies for collaborative inquiry among students and asynchronous discussion (Edelson, Gordin, & Pea, 1999, Addressing the Challenges of Inquiry-Based Learning through Technology and Curriculum Design, 1999

At present, the environmental protection has become the urgent need not only before India but also before the world. It can be possible only when there is one approach of developing the awareness among the people of the country especially the youth. Keeping in view this objective the country has made a provision of compulsory environmental education at undergraduate level. Although learning materials in print forms are available but there is a need of learning materials in multimedia format. It is assumed that effectiveness of e-content may be higher because of a joint presentation of text, picture, and graphics and sound to explain the concepts and processes of environment. Keeping in view this assumption, the investigator has decided to take this research project in hand.

STUDY MATERIAL ON SUSTAINABLE DEVELOPMENT

OBJECTIVES

1. Know about Sustainable development.
2. Concept and Characteristics of Sustainable development.
3. Differentiate between Sustainable and un-sustainability.
4. Areas of Sustainable development.
5. Understand the benefits Sustainable development.

CONCEPT AND CHARACTERISTICS OF SUSTAINABLE DEVELOPMENT

Two decades ago the world looked at economic status alone as a measure of human development. Thus countries that were economically well developed and where people were relatively richer were called advanced nations while the rest where poverty was wide-spread and were economically backward were called developing countries. Most countries of North America and Europe which had become industrialized at an earlier stage have become economically more advanced. They not only

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exploited their own natural resources rapidly but also used the natural resources of developing countries to grow even larger economies.

(http://present5.com/social-issues-and-the-environment-from-unsustainable-to/) Thus the way development progressed, the rich countries got richer while the poor nations got poorer.

(https://www.scribd.com/document/120142380/Social-Issues-and-the-Environment) However, even the developed world has begun to realize that their lives were being seriously affected by the environmental consequences of development based on economic growth alone. This form of development did not add to the quality of life as the environmental conditions had begun to deteriorate. (http://ijcrls.com/sites/default/files/issues-pdf/01119.pdf)

By the 1970s most development specialists began to appreciate the fact that economic growth alone could not bring about a better way of life for people unless environmental conditions were improved. Development strategies in which only economic considerations were used, had begun to suffer from serious environmental problems due to air and water pollution, waste management, deforestation and a variety of other ill effects that seriously affected peoples' well being and health. There were also serious equity issues between the "haves and the have nots" in society, at the global and national levels. (https://www.allfreepapers.com/Social-Issues/Social-Issues-and-the-Environment/18912.html) The disparity in the lifestyles between the rich and the poor was made worse by these unsustainability strategies. Many decades ago, Mahatma Gandhi envisioned a reformed village community based on sound environmental management. He stressed on the need for sanitation based on recycling human and animal manure and well-ventilated cottages built of recyclable material. He envisioned roads as being clean and free of dust. His main objective was to use village made goods instead of industrial products. All these principals are now considered part of sound long-term development. Gandhiji had designed a sustainable lifestyle for himself when these concepts were not a part of general thinking. (https://www.slideshare.net/NayanVaghela/society-government-and-environment-chapter-3)

Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for generations to come. The term was used by the Brundtland Commission which coined what has become the most often-quoted definition of sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing humanity. Ecologists have pointed to the limits to growth, and presented the alternative of a "steady state economy" in order to address environmental concerns.

The field of sustainable development can be conceptually broken into few constituent parts: environmental sustainability, economic sustainability, social sustainability, cultural sustainability and educational sustainability. (https://en.wikipedia.org/wiki/Social_sustainability)

AREAS OF SUSTAINABLE DEVELOPMENT

ENVIRONMENTAL SUSTAINABILITY

An "unsustainable situation" occurs when natural capital is used up faster than it can be replenished. Sustainability requires that human activity only uses nature's resources at a rate at which they can be replenished naturally. Inherently the concept of sustainable development is intertwined with the concept of carrying capacity. Theoretically, the long-term

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result of environmental degradation is the inability to sustain human life. Such degradation on a global scale could imply extinction for humanity.

The environmental economics become more important, the concerns for environment become more important and when we talk about the environmental sustainability it concerns more with the habitat the living environment, surrounding, the humming being and the most importantly all species living in the biosphere, in-fact the un-sustainability was because the concern was an man only, the human species only, The social aspect only, it was concerning for the development of man only, but when it become the issue man and environment it include both and the area expended to include all species existing on earth the total ecology become the focus and from development we more towards the sustainable Development.

ECONOMIC SUSTAINABILITY

To ensure sustainable development, any activity that is expected to bring about economic growth must also consider its environmental impacts so that it is more consistent with long term growth and development. Many 'development projects', such as dams, mines, roads, industries and tourism development, have severe environmental consequences that must be studied before they are even begun.

Large dams, major highways, mining, industry, etc. can seriously damage ecosystems that support the ecological health of a region. Forests are essential for maintaining renewable resources, reducing carbon dioxide levels and maintaining oxygen levels in the earth's atmosphere. Their loss impairs future human development. Loss of forests depletes biodiversity which has to be preserved to maintain life on earth. Major heavy industries if not planned carefully lead to environmental degradation due to air and water pollution and generate enormous quantities of waste that lead to long term environmental hazards. Toxic and Nuclear wastes can become serious economic problems as getting rid of them is extremely costly. Thus the economic benefits of a project must be weighed against the possible environmental costs before a project is permitted.

The dimension of economic sustainability When means of protection for the exchange of economic values only included environment and economics that means the ecological cost is also included because in just terms of money the development is not sustainable. What justifies is environmental justice included in that and by environmental justice we mean whatever the means of production on consumption values are there, they are not affecting the environment in adverse way. That is the Sustainability lies in those means of production, their consumption, which do not affect. The ecology of the area of the nation, or the globe as the whole. So economic sustainability lies extending the linkages of economics with the ecology and that is why ecology economics & environmental economics they have become important area for consideration in sustainable development. The environmental economics talks about, the capital stocks, the natural stock, not only the labor, and the productivity but the impact of that labour & productivity on the surrounding ecology & that is why economic sustainability is major concern when we talk about sustainable development.

SOCIAL SUSTAINABILITY

Social sustainability is one aspect of sustainable development. Social sustainability encompasses human rights, labour rights, and corporate governance. In common with environmental sustainability, social sustainability is the idea that future generations should have the same or greater access to social resources as the current generation. Social resources include ideas as broad as other cultures and basic human rights.

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Also we can speak of Sustainable Human Development that can be seen as development that promotes the capabilities of present people without compromising capabilities of future generations. In the human development paradigm, environment and natural resources should constitute a means of achieving better standards of living just as income represents a means of increasing social expenditure and, in the end, well-being. In sustainable development, social sustainability is also a concern because the social relationship decide whether the sustainable development will happen or not or whether they attempts for sustainable development their because the relationship among different groups matters a lot deciding the social capital, economic Capital Consumption pattern and the equity relationship between different groups. Particularly in India, where me have got this cast Relations they are the major concern because of the cast there is graded in equality in terms of consumption of Resources, not only in consumption of Resources but availability & accessibility to Natural Resources also. Cast is a major part for the production relation, cast decides the occupational pattern & those occupational patterns traditionally in India are Natural resource based, so social sustainability lies in removal of all disabilities & discrimination based on cast, so if we have to more towards sustainable development we have to decide & resolve the cast issue in favour of equitable distribution of natural resources & that to the cast pattern when it effects or adversely decide the equitable pattern of natural resources then the problems of un-sustainability comes up. So for Social sustainability it is important that cast and gender relations also, in social dimension & other very important area is gender inequality because Men & Women they have got different accessibility towards natural resources uses in its consumption some have to resolve the issue of cast & gender in equality to ensure sustainable development.

CULTURAL SUSTAINABILITY

For sustainable development the biodiversity base is important, so is culture diversity. Cultural Sustainability becomes another an important area for sustainable development, if the culture diversity is more than this will provide a broader base for sustainable development, more the diversity more is the stable pyramid where it is of food of energy flow & that is how the cultural diversity also ensure sustainable development. Mono culture society they have very adverse relationship with natural resources, the ecology & that is why when me consider tribal society, it is very close to nature but the tribal society & non tribal society when they are together living adjacent to biosphere, or tiger reserves or environment preservation areas then definitely they sustain & we have got some society, some samaj, cast like vishnoi samaj they are protect the environment, in fact for them the environment is like good, wild life they can sacrifice their life to protect the wild life adjacent to their areas & that is how me must learn different cultures have got different meanings towards the environment understanding the environment and they have got. Different interactions & inter linkages with the adjoining environment. So more cultural diversity meant wore cultural sustainability, for sustainable development there for cultural sustainability is very essential dimensions.

EDUCATIONAL SUSTAINABILITY

Groundwork has been laid for sustainability education worldwide. Recent changes in service learning, a focus on literacies and skills, standards that support interdisciplinary thinking, and the role of systems thinking have all increased the visibility of the movement. Various approaches to educational sustainable development encourage people to understand the complexities of, and synergies between, the issues threatening planetary sustainability and understand and assess their own values and those of the society in which they live in the context of sustainability.

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Educational sustainable development seeks to engage people in negotiating a sustainable future, making decisions and acting on them. While it is generally agreed that sustainability education must be customized for individual learners, according to Tilbury and Wortman, the following skills are essential to educational sustainable development:

- For imagine a better future envisioning is important. The premise is that if we know where we want to go, we will be better able to work out how to get there.
- Systemic thinking acknowledging complexities and looking for links and synergies when trying to find solutions to problems.
- Building partnerships-promoting dialogue and negotiation, learning to work together.
- Participation in decision-making empowering people.

Education is a key to development & education for sustainable development can only ensure our common future. The education system that we have today is not very much concerned with the participation and attitudes towards environment, for that we need to evolve education pattern which is conducive for sustainable development & for that education for sustainable development that to acronym E.S.D. has become very essential rather, in education pattern it is not only the learning of the skill development but participation attitude towards environment preservation, conservation are essential dimension for that. Environmental education is for sustainable Development & at every level of schooling of college life me must develop the pattern the curriculum conducive for environmental education because by environmental education only we can have the positive attitude towards environment we can involve participatory approach for environmental conservation, we can have the skill development so that the student they learn how to live with the environment, how to protect the environment & how to protect their future & sustainable development is about our common future. & education can only guide us towards our common future, education can only sustain our world, our living, they only planet perhaps in the universe which has got live, so environmental education or education for sustainable development rather will be the most crucial dimension of sustainable development. (https://en.wikipedia.org/wiki/Education_for_sustainable_development)

CAUSES OF UN-SUSTAINABILITY

POPULATION GROWTH: In 2012 the world's population is just over 7 billion. It has doubled since 1950 and in the next fifty years is expected to reach about 10 billion. The highest population growth is in the poorer countries. Populations in the West are growing but at a much lower rate. There about five people in Third World countries compared to only one in Western industrialized countries. (https://www.scribd.com/presentation/148290943/EVS-12-3-12-pptx)

ENERGY CONSUMPTION: the Western countries use far more energy. The average person uses 40 times as much as a person in the Third World. However, if all the Third World countries became developed and their energy use increased, there would not be enough oil, gas and coal to go around.

RESOURCES CONSUMPTION: the West represents about 20% of the world's population, but uses over 80% of the world's resources for its energy needs and for its industries. Again, there would be a problem of insufficient resources if all the Third World countries developed in the same way as Western countries.

Major causes for unsustainable development is differential pattern of consumption over consumption & asymmetrical relations. In over consumption beyond our basic needs, the consumption pattern is not healthy & that means

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we are consuming the natural resources beyond the carrying capacity of beyond the limit that we have on our capital stock. What happens in over consumption suppose an affluent society or developed society is consuming more resources than existing in that area than definitely the extra resources, additional resources they get from the near by society neighbouring societies & that's why they encroach up on the natural right of other societies, other nations & similarly when. We analysis the western consumption pattern, then we can see the differences because in our country or in countries like Bangladesh, they are very much deprived their share, the global share & that is why the affluent Society they consume more & there consumption pattern lead to un-sustainability in global terms. And that is why when we think about 80:20 Ratio that means 80 % Resources are being consumed by 20 % of the affluent society, will lead to consequences, ultimately towards un-sustainability. So for sustainable development we have to think about the over consumption pattern & besides that there are asymmetry relationships also. Asymmetry Relationship means equitable distribution of recourses. Not their equitable distribution of income is not their & the natural resources which are globally shared are not shared equitably & that is how me see the major causes of un-sustainability existing in the society.

ROLE OF INDIVIDUAL IN SUSTAINABLE DEVELOPMENT

We as citizens of our Nation, and increasingly as citizens of one common future at the global level, must constantly monitor the pattern of development. If we see that a development project or an industry is leading to serious environmental problems, it is our duty to bring this to the attention of authorities such as the local administration, the Forest Department or the Pollution Control Board, to look into the issue. Further if new development projects are being planned in and around the place where we live it is our duty to see that this is brought about in accordance with environmental safeguards. While we all need to think globally, we need to act locally. We have to see to it that we change development from its present mandate of rapid economic growth without a thought for future ecological integrity, to a more sustainable eco-logically appropriate strategy.

If new projects of a large size are to be passed Government has made it compulsory to publish the summary report of the Environmental Impact Assessment (EIA) and conduct a 'Public Hearing'. It is essential that all of us as responsible citizens read evaluate and respond to such public hearings held in our area and make comments on the possible impacts of the project. In many situations there are proponents of the project who only look at their own rapid economic gains. It is for citizens as concerned individuals and groups to counter these vested interests so that our environment is not de- graded further. Life has to be made more livable for all. We cannot support the economic growth of one sector of society while we permit environmental degradation to destroy the lives of the less fortunate. (https://www.slideshare.net/sksuresh/corporate-social-responsibility-26309963)

BENEFIT OF SUSTAINABLE DEVELOPMENT

Benefit of sustainable development is for humanity if sustainable Development is not there, then a point may come, a day may come where our future our common future will not be their in healthy terms, in ecological terms, we may not have the pure air to breath, we may not have healthy food to Eat. We may not have the conducive environment where life can exist, so it is not the question of humanity but the life as a whole & as pointed out the only planet that we have perhaps in the universe is our earth, our mother Earth, & our common future depend on how we treat our mother Earth. And sustainable development only can insure that kind of development were our mother can sustain our

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life in a healthy manner and our common future can be saved, so for sustainable development therefore the very important aspect to consider is not of the humanity but life as a whole, we have to preserve, conserve our life & for that we must march towards sustainable development.

AGENCIES ENGAGED IN MONITORING OF SUSTAINABLE DEVELOPMENT

Many agencies are involved in monitoring and regulating the development. In India, we have central pollution control board and pollution control board of states, which work as "watch dog" for the pollution level and also give green signal to a particular project after a thorough check of various parameters.

Local Administrative Bodies of cities also have the right and power to inspect and even stop non-environment friendly activity. Large projects like dams, mines, roads, industries and tourism have severe environmental consequences, are to be passed through Environmental Impact Assessment then only they can get a non-objection certificate from Ministry of Environment And Forestry.

Many NGOs (Non Government Organizations) like Chipko Movement, Apika Movement, Narmada Bachao Andolan etc. also play a vital role in conserving the environment.

For Framing policies for sustainable development, roll of different agencies are important. NGOs play a very important role but we have also to explore vision of environment personalities like Mahatama Gandhi & Baba sahib Ambedker who envisioned future society & like they had thinking how to provide resources for our society, how to use the available resources & how our future society will require, resources & Baba sahib Ambedker played a Great role there.

He is the person who gave us a kind of water policy which is very important in global terms for sustainable development because he considered environmental resources for the best advantage to all sections of the society, he was not just thinking in a narrow perspective but his vision was very broader & for long terms. His water policy for which he considered water is a resource for all that means he considered no provisional boundary can limit the river, the flowing water & all people of nation, all citizens they have equal right on that water. He considered water ways like Railways, when we travel in Rails me do it we are passing through different provisions, we do it think Gujrat has passed & Maharastra has come. But the river disputes that we face today whether it is Narmada river where Guhrat & Maharastra & neighboring states are fighting or it is the issue of Ganga & Kaveri only Baba Saheb vision can be helpful & it is very relevant to resolve this issues. Once water become a central subject that means like Railways will have water ways & such disputes will not occur.

The world today is roughly polarized between the prospers and the poor although we prefer to call this division by fancy name like the developed and the developing. Now in this may race for so called development the immediate victim was certainly is the depicting the natural resources, but ultimately the victim is the entire human race, it is therefore imperative that we stop; turn back and take a look at the damage that we have done, damage to the environment and to the society. And then we must consider how best we can remedy the situation for the future. The only hope seems to be in sustainable development and this sustainable development is to be all around environment, social, economic, cultural and educational.

HYPOTHESES

In the present research study the following null hypotheses were tested:

There is no significant difference between e-content study (experimental) group and non e-

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content study (control) group in terms of post treatment knowledge attainment on Sustainable Development by equating the groups on pre treatment knowledge attainment and attitude towards Environmental management.

METHODOLOGY

SAMPLE

For the present study a sample of 80 undergraduate science students was selected randomly from St. Aloysius College, Jabalpur. Out of selected 80 students, 40 comprised the Experimental group and rest 40 comprised control group. In the Experimental group the number of male students is 17 and the number of female students is 23. In the Control group there are 19 male students and rest 21 female students. The age range of the students selected in the sample is 19-21 years. The number wise details of the sample are given below:

Table 1.Schematic Representation of Sample

Gender	**Groups**		**Total**
	Experimental	**Control**	
Male	17	19	36
Female	23	21	44
Total	**40**	**40**	**80**

RESEARCH DESIGN

The present study is an experimental research study. Non-Equivalent Control Group Quasi-Experimental design has been used. The layout of design is given below:

Table 2.Research Design

Experimental Group O1 X O2
Control Group O1 O2

In the present study treatment given to both the groups was the independent variable. To the experimental group a treatment of the study of e-content was given. The control group was busy in its routine activities. Both the groups were given different types of treatments whose effect on the dependent variable was to be studied. The dependent variables were post treatment knowledge attainment on Sustainable development; post treatment attitude towards sustainable development; and post treatment reaction of experimental group for e-content. An independent variable is presumed cause of the dependent variable learning material. In experiments independent variable is the variable manipulated by the experimenter. The dependent variable is the variable predicted to where as the independent variable is predicted from (**Kerlinger, Fred. N.,** Foundations of Behavioural Research, S.S. Chhabra for Surjeet Publications, 2000)

Tools

For the collection of the required data the following tools were used:

1. Knowledge Attainment Test (KAT)
2. Attitude Towards Environmental Management Scale (ATEMS)

The details of these tools are given below:

KNOWLEDGE ATTAINMENT TEST (KAT)

To study the effectiveness of e-content learning material in terms of knowledge attainment of undergraduate students on sustainable

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development the Knowledge Attainment Test was developed by the investigator. To measuring the knowledge attainment of students in relation to a particular e-content learning material on sustainable development. For this 18 questions/items were selected. All the questions are objective type. In each question there is a statement supported by four alternatives, out of which only one is correct. The respondents are required to read the statement carefully and put a tick mark against the correct alternative. The students are given a maximum of twenty minutes to complete the test. For the correct answer one mark is to be given to the respondent. The incorrect answer carries zero mark.

TEST-RETEST RELIABILITY OF KNOWLEDGE ATTAINMENT TEST

The test-retest reliability for all the sections of Knowledge Attainment Test was obtained which is as below:

Table 3.Test-Retest Reliability of Knowledge Attainment Test

S. No.	Knowledge Attainment Test on	Test Retest Reliability
1.	Sustainable Development	.75

ATTITUDE TOWARDS ENVIRONMENTAL MANAGEMENT SCALE (ATEMS)

To measure the attitude of the selected sample towards e-content learning material the investigator developed an attitude scale and named it Attitude towards Environmental Management Scale. This scale has been developed on the basis of Likert Summated Rating (1932). The scale carries 57 items. Each item is in the form of a statement showing a particular aspect of environmental management. In front of each item there is a scale having five alternatives which show the different levels of the agreement of the respondent for the idea given in the statement. In the scale there are 37 positive items and rest 20 negative items. The alternatives of the items and their respective scores are as below:

SCORES FOR POSITIVE ITEMS

Strongly Agreed	(SA)	5
Agreed	(A)	4
Undecided	(UD)	3
Disagreed	(D)	2
Strongly Disagreed	(SD)	1
Scores for Negative items		
Strongly Agreed	(SA)	1
Agreed	(A)	2
Undecided	(UD)	3
Disagreed	(D)	4
Strongly Disagreed	(SD)	5

The maximum score of a respondent for this scale can be 57X5=285 while minimum score can be 57x1=57.

The split half reliability of the developed attitude scale was found to be .71. The content validity of Attitude Towards Environmental Management Scale was established.

DATA ANALYSIS AND RESULTS

Keeping in view the objectives and the hypotheses of the present study the tabulated

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data were analyzed by using mean and ANCOVA as a statistical technique.

EFFECTIVENESS OF E-CONTENT ON SUSTAINABLE DEVELOPMENT

The null hypothesis of the present study "The e-content study (experimental) group and non e-content study (control) are not significantly different from each other in terms of post treatment knowledge attainment on Sustainable Development if pre treatment knowledge attainments on Sustainable Development and attitude towards environmental management have been considered as covariates". To meet test this null hypothesis the data were collected by administering Knowledge Attainment Test and Attitude Towards Environmental Management as per the experimental design of the study. The obtained data were analysed by using Mean and ANCOVA. The result obtained are given in following Tables 4 and 5:

Table 4.Adjusted Mean and SD For Experimental and Control Group for the Program Sustainable Development

Dependent Variable: POST-TEST SCORES OF ACHIEVEMENT on Sustainable Development			
GROUP OF THE STUDENTS	**N**	**Std. Deviation**	**Mean**
EXPERIMENTAL GROUP	40	1.776	8.98
CONTROL GROUP	40	2.061	6.40
Total	**80**	**2.309**	**7.69**

Table 5.Summary of ANCOVA for Post-Test Scores of Achievement on Sustainable Development By Taking Attitude and Pre Test as Covariates.

Source	**Type III Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
GROUP_CD	44.526	1	44.526	27.962	.000
Error	121.020	76	1.592		
Total	**421.187**	**77**			

It can be seen in the Table 4 that the F value for group is 27.962 which is significant at 0.01 level with df equals to 1/76. It means both the adjusted means 8.98 and 6.40 are significantly different from each other. In the light of this result the null hypothesis is rejected. Since the adjusted mean of 8.98 of knowledge attainment scores of experimental group is significantly higher than the adjusted mean of 6.40 of knowledge attainment scores of control group, therefore it can be concluded that the e-content study group is significantly higher than the non e-content study group in terms of post treatment knowledge attainment on Sustainable Development.

CONCLUSIONS

On the basis of the findings of the present study following conclusions have been drawn:

1. The e-content study group is significantly higher in comparison to non e-content study group in terms of post treatment knowledge attainment on sustainable development, if both the groups are equated on pre treatment knowledge attainment and pre treatment attitude towards environmental management.
2. The e-content study group is significantly higher in comparison to non e-content study group in terms of post treatment attitude towards environmental management if both the groups are equated on pre treatment knowledge attainment and pre treatment attitude towards sustainable development.

REFERENCES

[1]. Elians, M. Awad and Hassan, Gharziri, Knowledge Management, Dorling

 ISSN: 2581-3439

Kindersley (India) Pvt. Ltd., Licenses of pearson Education in South Asia, Third Impression, 2009.

[2]. Singh, P.P. and Sharma, Sandhir, e-Learning – New Trends and Innovation, Deep & Deep Publication Pvt. Ltd., 2005.

[3]. Mangal, S.K. and Mangal, Shubhra, Research Methodology in Behavioural Science, PHI Learning Pvt. Ltd., 2013.

[4]. Ahluwalia, S.K., Basic principal of Environmental & Resources, ABD Publishers, Jaipur, India, 2006.

[5]. Singh, Jagbir, Environmental Development, Challenges & opportunities, I.K. International Pvt. Ltd., 2005.

[6]. Dave, Deeksha and Katewa, S.S., Text Book of Environmental Studies, Cengage Learning, India Pvt. Ltd., 2012.

[7]. Kerlinger, Fred. N., Foundations of Behavioural Research, S.S. Chhabra for Surjeet Publications, 2000.

[8]. Sarangi, Prasant, Research Methodology, Taxmann Publications Pvt. Ltd., 2010.

[9]. Edelson, Gordin and Pea, Addressing the Challenges of Inquiry-Based Learning through Technology and Curriculum Design, 1999.

[10]. Reid, David (1995), Sustainable development: An Introductory Guide. Earth Scan. London.

[11]. Purohit, Shammi and Agrawal, A text book of Environmental Science, Student Edition, Jodhpur.

[12]. Sharma, P.D., Environmental Biology and Toxicology. Rastogi Publications, Merut, India.

[13]. Kaushik and Kaushik, Perspectives in Environmental Studies, New Age International Publication, New Delhi.

[14]. Joshi, Y. N., Verma, D. K., "Social Environment for sustainable Development", Prem Rawat for Rawat Publication, Jaipur.

[15]. Foreword By Gandhi, Rajiv, "Our common Future", Oxford University Press, Waltson Street, Oxford OX26Dp.

[16]. http://spotswoodcollege.school.nz/byod/.

[17]. http://www.simonjohnmarshall.com/?p=79.

[18]. http://teswell.blogspot.com/2009/08/discussion-forums.html.

[19]. http://teswell.blogspot.com/2009/08/discussion-forums.html.

[20]. https://phdessay.com/ict-in-language-teaching/.

[21]. https://www.scribd.com/document/20895810/E-Learning.

[22]. http://ijcrls.com/sites/default/files/issues-pdf/01119.pdf.

[23]. https://www.slideshare.net/NayanVaghela/society-government-and-environment-chapter-3.

[24]. https://www.slideshare.net/NayanVaghela/society-government-and-environment-chapter-3.

[25]. https://en.wikipedia.org/wiki/Social_sustainability.

[26]. (https://en.wikipedia.org/wiki/Education_for_sustainable_development).

[27]. https://en.wikipedia.org/wiki/Education_for_sustainable_development.

[28]. https://www.scribd.com/presentation/148290943/EVS-12-3-12-pptx.

[29]. https://www.slideshare.net/sksuresh/corporate-social-responsibility-26309963.

[30]. https://www.slideshare.net/sksuresh/corporate-social-responsibility-26309963.

[31]. https://www.slideshare.net/sksuresh/corporate-social-responsibility-26309963.

[32]. http://spotswoodcollege.school.nz/byod/. (n.d.).

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