

Effect Of Online Collaborative Learning Strategy On Achievement In Economics In Relation To Self-Efficacy

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Abstract: The present study investigates the effect of online collaborative learning strategy on achievement in Economics in relation to self-efficacy. The sample consisted of 120 students of XI class from two private schools of Amritsar city affiliated to CBSE, New Delhi. The study covered two independent variables viz. instructional strategies and self-efficacy. The variable of instructional strategies was studied at two levels, namely online collaborative learning strategy and conventional teaching strategy. The variables of self-efficacy was studied as three levels, namely high, average and low self-efficacy. The dependent variable was the performance gain which was calculated as the difference in post test and pre-test scores. The experimental group was taught through online collaborative learning strategy on various 10 topics from the Economics subject of class XI and the control group was taught by conventional method teaching by the investigators. The instructional material and achievement test in Economics was developed by the investigators. The tool was used for data collection. The achievement test in Economics and self-efficacy scale was also administered. After pre and post-testing on all the students, the mean gain scores were computed. The statistical techniques such as Mean and SD were used in the analysis of data. F-ratio and t-test were employed to find significance of difference between means related to different groups and variables. The data was analyzed using Analysis of Variance (2x3) and following conclusions were drawn: (i) The performance of achievement group taught through online collaborative strategy was found significantly higher as compared to control group. (ii) The performance of high self-efficacy groups was higher than that of average and low self-efficacy groups. (iii) There was no significant interaction effect between online collaborative learning strategies and self-efficacy on achievement in Economics.

Index Terms: Online Collaborative Learning Strategy, Conventional Teaching Strategy, Achievement in Economics, Self-Efficacy.

Introduction

Education is the pillar of our society. From the ancient times till today's period various changes have been take place in sphere of education. The method of teaching and learning, mode of instructions, availability of reading material, everything has been changed. Collaborative learning strategy is one of those changes in today's education system. Unlike traditional method, by using collaborative learning strategy the students use to learn in peer group which in many ways help them to learn better. Collaborative learning strategy has positive effect on achievement of students in any subject and self-efficacy of students. Collaborative learning strategies in modern teaching helps the students to learn effectively in group which in turn inculcate among them various values like cooperativeness, tolerance, honesty, brotherhood etc. In general, collaborative learning strategy is advanced form of learning. Learning is the process of acquiring new or modifying existing knowledge, behavior, skills, values, or preferences. Evidence that learning has occurred may be seen in changes in behavior from simple to complex, from moving a finger to skill in synthesizing information or a change in attitude [1]. In the modern times, the technological developments have given some new meanings to learning. Various changes have taken place. Collaborative learning is one of those changes.

Online learning has been considered as an excellent medium of transmission and retrieval of information through course notes [2]. Online education is a type of distance learning-taking courses without attending a brick-and-mortar school or university. Instead, online students and teachers interact over the internet. Online education not only enables students to take their courses anywhere at any time, but it increases student interaction, enables student centered teaching, facilitates peer to peer learning, and provides successful student learning outcomes. Students in online conditions performed modestly better, on average, than those learning the same materials through traditional face to face instructions. According to [3] online communication systems offers a potentially rich social learning environment and flexibility in accessing online discussion, which can support and facilitate active group based online learning. Online instruction system allows learners to respond at a time that best suits to them. Online education and teaching is conveying information or concepts to the learner via the computer network system, internet or web based learning environment [4].

Online learning represents a paradigm shift not only for learners, but also for instructors, trainers, administrators, technical and other support services staff, and the institution. We (i.e., students, instructors, and staff) are accustomed to the structure of a traditional educational system where instructor-led, face-to-face classes are the learning environment. Online learning, on the other hand, is an innovative way of providing instruction to diverse learners in an environment where students, instructors, and support staff do not see each other in physical form. The format of such a learning environment is different from traditional classroom instruction. Traditional classroom based instruction takes place in a closed system (i.e., within the confines of a given classroom, school, textbook, or field trip) whereas e-learning takes place in an open system i.e., it extends the boundaries of learning to an open and flexible space where learners

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decide where and when they want to learn [5]. Online education is a type of distance learning, taking courses without attending a brick-and-mortar school or university. Instead, online students and teachers interact over the internet [6].

Collaborative learning is rooted in [7] concept of learning called zone of proximal development. Typically there are tasks that learners can and cannot accomplish. Between these two areas is the zone of proximal development, which is a category of things that a learner can learn but with the help of guidance. The zone of proximal development gives guidance as to what set of skills a learner has that are in the process of maturation. In [7] definition of zone of proximal development, he highlighted the importance of learning through communication and interactions with others rather than just through independent work. This has made way for the ideas of group learning, one of which being collaborative learning.

The origins of collaborative learning as a teaching methodology can be traced back to ancient civilizations. However, it was replaced by other learning philosophies both in the West and in the colonized East. Collaborative learning was granted a new lease of life in the second half of the 20th century when research showed that students learned faster and retained more when they became partners in the process of teaching and learning instead of remaining mere receivers of knowledge from their educators. The contemporary concept of collaborative learning began to interest educators in the West after theories of personality development, group dynamics and social cognitive mechanisms began a fresh thought process into learning mechanisms and classroom techniques. Though there is no one point of origin that can be attributed to the process of Collaborative Learning, one can find many related ideas that have helped the formation of this teaching tool. Dewey's explorations into the social nature of learning and his advocacy of teaching through discussion and through hands-on problem solving; Elwin's social interdependence concepts and Deutsch's ideas on cooperation and competition can be seen as early seeds of the collaborative learning process [8].

Collaborative learning is broadly defined as "a situation in which two or more people learn or attempt to learn something together," and more specifically as joint problem solving [9]. [10] define collaboration more specifically as "mutual engagement of participants in a coordinated effort to solve a problem together," (as cited in [11]). [9] Notes the difficulty of agreeing on a definition of collaborative learning, even among experts. Ambiguity in the meaning of collaborative learning stems from several sources. First, the scale of such interactions may range from two people to thousands, with different theoretical tools needed to analyze interactions occurring at different levels. Second, the question of what constitutes learning is a source of uncertainty. As [9] explains, researchers use "learning" to refer to several different types of activities:

- (i) Students studying course materials together for a test;
- (ii) Joint problem solving in which learning is assumed to occur as a by-product of interactions;
- (iii) Learning as a "biological and/or cultural process" that takes place over several years ; and
- (iv) "Learning from collaborative work, which refers to the lifelong acquisition of expertise within a professional community"?

[9] Notes that nothing is inherently instructive about working with more than one person on a task; rather, interaction triggers learning processes. Collaborative learning situations require instructions, a physical setting, and other kinds of performance constraints. These elements do not guarantee collaboration; they only make it more likely

As [9] notes, there are several qualities that characterize truly collaborative interactions. First, collaboration is characterized by a relatively symmetrical structure, however that symmetry is accomplished. For example, in situations with symmetry of action, each participant has access to the same range of actions. This contrasts with the typical division of labor in cooperative learning structures; partners split up the work, solve sub-tasks individually, and then put their respective contributions together. Symmetry of knowledge occurs when all participants have roughly the same level of knowledge, although they may have difference perspectives. Symmetry of status involves collaboration among peers rather than interactions involving supervisor/subordinate relationships. Finally, symmetry of goals involves common group goals rather than individual goals that may conflict.

Another marker of true collaboration is the quality of interactions, especially the degree of interactivity and negotiability [9]. Interactivity refers to the extent to which interactions influence participants' thinking. Negotiability refers to the extent to which no single group member can impose his view unilaterally on all others, but rather all group members must work toward common understanding. [9] Points out that trivial, obvious, and unambiguous tasks provide few opportunities to observe negotiation because there is nothing about which to disagree. Moreover, misunderstandings may actually be important from a learning standpoint; they force participants to construct explanations, give reasons, and justify their positions.

Collaboration can have powerful effects on student learning, particularly for low achieving students. These effects are seen in the form of higher scores on work completed collaboratively, even when students turn in separate products. In addition, there appears to be a carry-over effect, such that individual performance on subsequent measures of achievement tends to be higher for students exposed to collaborative learning. However, a number of factors may moderate the impact of collaboration on student learning, including student characteristics, group composition, and task characteristics. For example, patterns of interaction as well as the effects on subsequent performance vary across males and females, with boys participating more actively and appearing to benefit more from collaborative learning than girls. Similarly, high ability students may participate more actively than low-ability students. Group composition, with respect to gender and ability, is also an important factor. Thus, heterogeneous groups featuring a narrow ability range appear most successful, as do groups that have a balance of girls and boys. Finally, task characteristics, such as the degree of role interdependence, and task and reward structures can impact the types of group processes used [12].

Collaborative learning approaches were employed in the 1970s by ¹³ and colleagues in the field of language and learning such as [14]; [15] At the school level in Great Britain, Australia, Canada, and the United States, Collaborative learning has often developed in conjunction with areas such as language across the curriculum, whole language learning,

oracy, psycholinguistics, learning through talking, negotiating the curriculum, etc. These perspectives tend to focus on creating an environment that best helps an individual to develop mentally, emotionally, and socially through being an active participant, personally committed to learning within the context of a supportive learning community. [16] Identify the individuals who have taken significant leadership in collaborative learning at the conceptual and research level, and in the practical classroom implementation level, with some contributing to both. In higher education, collaborative learning is arguably the most recent of the three approaches to group learning, being recognized as a unique approach to group learning in higher education in part through the efforts of [17, 18, 19]. Bruffee often identifies collaborative learning as interpretive in nature, meaning that individuals strive to understand and act in the world around them. His definitions share much with social constructivism, but with a critical stance, as he recommends that professors should see themselves as change agents who help students better themselves by developing independence through interdependence.

Collaborative learning is very important in achieving critical thinking. According to [20], individuals are able to achieve higher levels of learning and retain more information when they work in a group rather than individually, this applies to both the facilitators of knowledge, the instructors, and the receivers of knowledge, the students.

According to [21] stated that collaboration is the mutual engagement of participants in a coordinated effort to solve a problem together. Collaborative interactions are characterized by shared goals, symmetry of structure, and a high degree of negotiation, interactivity, and interdependence. Interactions producing elaborated explanations are particularly valuable for improving student learning. Non-responsive feedback, on the other hand, can be detrimental to student learning in collaborative situations. Collaboration can have powerful effects on student learning, particularly for low-achieving students. However, a number of factors may moderate the impact of collaboration on student learning, including student characteristics, group composition, and task characteristics. Although historical frameworks offer some guidance as to when and how children acquire and develop collaboration skills, there is scant empirical evidence to support such predictions. However, because many researchers appear to believe children can be taught to collaborate, they urge educators to provide explicit instruction that encourages development of skills such as coordination, communication, conflict resolution, decision-making, problem-solving, and negotiation. Such training should also emphasize desirable qualities of interaction, such as providing elaborated explanations, asking direct and specific questions, and responding appropriately to the requests of others. Teachers should structure tasks in ways that will support the goals of collaboration, specify "ground rules" for interaction, and regulate such interactions

Thus, collaborative learning is an instruction method is, in which students work in groups toward a common academic goal. The collaborative learning medium provides students with opportunities to analyze, synthesize, and evaluate ideas cooperatively. The informal setting facilitates discussion and interaction. The students have to go beyond mere statements of opinion by giving reasons for their judgments and reflecting upon the criteria employed in

making these judgments. Thus, each opinion is subject to careful scrutiny. The ability to admit that one's initial opinion may have been incorrect or partially flawed is valued [20].

In the past, collaborative learning activities have been restricted to full-time students in on-campus settings because of the logistical difficulties in finding time and space for students to work together [22]. However, the advent of Internet-based communication technologies has transformed higher education for both teachers and learners [23]. The introduction of more flexible approaches to learning and greater use of online tools offers new opportunities for student collaboration and new challenges for teachers supporting group work [24]. The course management systems that have been widely adopted in the university sector, such as Web CT and Blackboard, incorporate tools for synchronous and asynchronous online communication and student presentations. Distance learners, who previously had little contact with other students, can now take part in discussion forums and group activities. Support for learning "anytime, anywhere" has also changed patterns of on-campus attendance at many institutions, meaning that students come to class irregularly, infrequently or not at all. These changes challenge instructors to provide opportunities and support for collaboration amongst learners, studying in different locations at different times.

Online collaborative learning theory provides a model of learning in which students are encouraged and supported to work together to create knowledge: to invent, to explore ways to innovate, and, by so doing, to seek the conceptual knowledge needed to solve problems rather than recite what they think is the right answer. While Online collaborative learning theory does encourage the learner to be active and engaged, this is not considered to be sufficient for learning or knowledge construction. In the online collaborative learning theory, the teacher plays a key role not as a fellow-learner, but as the link to the knowledge community, or state of the art in that discipline. Learning is defined as conceptual change and is key to building knowledge. Learning activity needs to be informed and guided by the norms of the discipline and a discourse process that emphasizes conceptual learning and builds knowledge. Online collaborative learning builds on and integrates theories of cognitive development that focus on conversational learning conditions for deep learning development of academic knowledge [25] and knowledge construction [26].

From the very early days of online learning, some instructors have focused heavily on the communication affordances of the Internet (see for instance [27]). They have based their teaching on the concept of knowledge construction, the gradual building of knowledge mainly through asynchronous online discussion among students and between students and an instructor.

Core Design Principles of Online Collaborative

Learning

[28] Emphasizes the importance of three key phases of knowledge construction through discourse:

- (i) Idea generating: this is literally brainstorming, to collect the divergent thinking within a group;
- (ii) Idea organizing: this is where learners compare, analyze and categorize the different ideas previously generated, again through discussion and argument;

- (iii) Intellectual convergence: the aim here is to reach a level of intellectual synthesis, understanding and consensus (including agreeing to disagree), usually through the joint construction of some artifact or piece of work, such as an essay or assignment.

This results in what [28] calls a Final Position, although in reality the position is never final because for a learner, once started, the process of generating, organizing and converging on ideas continues at an ever deeper or more advanced level. The role of the teacher or instructor in this process is seen as critical, not only in facilitating the process and providing appropriate resources and learner activities that encourage this kind of learning, but also, as a representative of a knowledge community or subject domain, in ensuring that the core concepts, practices, standards and principles of the subject domain are fully integrated into the learning cycle.

Achievement is the pivot and center of educational growth and development. In general, it refers to the scores obtained in annual examination. It is measured and assessed by achievement test and compared to the set norms to evaluate an individual's performance. Achievement occupies the most important place in the field of education. The importance of achievement is evident from the efforts being put in by all educational institutions to maximize the achievement of their students. Achievement is the most important goals of education. It refers to degree or level of success of proficiency attained in some specific area concerning scholastic or academic work. It may have a pervasive effect on students' personal behavior toward a goal. Achievement is the outcome of a learning process. The degree of learning and mastery in the content can be assessed by level of achievement. Knowledge of achievement is very important in the process of learning a skill or language, in order to do further improvements in instruction and learning strategies and ultimately to enhance the level of achievement.

According to [29] achievement can be defined as the extent to which a learner is profiting from instruction in a given area of learning or in other words, achievement is reflected by the extent to which skill and knowledge has been imparted to him. According to [30] achievement is viewed basically as the competence, a person have in a domain of knowledge. It is referred to as acquisition, learning, or knowledge representation, characterized by the degree of inference required on the part of the student to give a response.

When a person is said to be an achiever we perceive him to have shown maximum of his abilities and full potential to accomplish a particular field. In the field of education achievement is generally taken as marks, grades obtained in the final examinations or level of perfection attained in particular area of work. Talking in relevance to this study achievement will said to be the end product of a learning activity, in which students' potential will be believed to be realized to the utmost level, and is assessed after the completion of the learning activity.

Self efficacy theory was originated from Social Cognitive theory by [31] in 1982. The self-efficacy theory lies at the center of [31] social cognitive theories, which emphasizes the role of observational learning and social experience in the development of personality. The main concept in social cognitive theory is that an individual's

actions and reactions, including social behaviors and cognitive processes, in almost every situation are influenced by the actions that individual has observed in others. Because self-efficacy is developed from external experiences and self-perception and is influential in determining the outcome of many events, it is an important aspect of social cognitive theory. Self-efficacy represents the personal perception of external social factors. According to [31] theory, people with high self-efficacy—that is, those who believe they can perform well—are more likely to view difficult tasks as something to be mastered rather than something to be avoided.

Self-efficacy is an individual's belief in their innate ability to achieve goals. [31] defines it as a personal judgment of "how well one can execute courses of action required dealing with prospective situations". Expectations of self-efficacy determine whether an individual will be able to exhibit coping behavior and how long effort will be sustained in the face of obstacles. Individuals who have high self-efficacy will exert sufficient effort that, if well executed, leads to successful outcomes, whereas those with low self-efficacy are likely to cease effort early and fail. Psychologists have studied self-efficacy from several perspectives, noting various paths in the development of self-efficacy; the dynamics of self-efficacy, and lack thereof, in many different settings; interactions between self-efficacy and self-concept; and habits of attribution that contribute to, or detract from, self-efficacy. Kathy Kolbe adds, "Belief in innate abilities means valuing one's particular set of conative strengths. It also involves determination and perseverance to overcome obstacles that would interfere with utilizing those innate abilities to achieve goals."

Self-efficacy affects every area of human endeavor. By determining the beliefs a person holds regarding their power to affect situations, it strongly influences both the power a person actually has to face challenges competently and the choices a person is most likely to make. These effects are particularly apparent, and compelling, with regard to behaviors affecting health [32].

[33] believed that self-efficacy can also play a role in health and healthy behaviors. For example, it can play a role in how much people persist in changing risk behaviors (such as quitting smoking or sticking to an exercise regimen). People who has higher levels of self-efficacy:

- Tend to view the challenges they face as things to be mastered.
 - Rather than getting discouraged in the face of obstacles, they see it as an opportunity to learn new things, acquire new skills, and grow as a person.
 - Setbacks are inevitable in life, but people who possess a strong sense of self-efficacy are more likely to recover quickly.
 - They also tend to be more involved in the pursuit of their goals and take more active role in the activities in which they participate.
 - Feel more intrinsically motivated to pursue goals.
- By contrast, people with a weaker sense of self-efficacy may tend to:
- View challenges as overwhelming and something to be avoided.
 - Get discouraged and give up when they face obstacles in the path of reaching their goals.
 - Avoid getting deeply involved and are less committed to groups and activities.

Research suggests that many choices that directly impact health, including physical exercise, seat -efficacy. Levels of self-efficacy help control how people initiate health choices and behavior changes as well as how well they stick to their health resolutions.

[33] describe a number of different sources of self-efficacy. Self-efficacy begins to form early in childhood and is an essential part of self-knowledge. As children have new experiences and gain new knowledge, they gain a better understanding of themselves and others. Their experiences with different tasks, people, and situations help contribute to this always growing and evolving sense of self-efficacy. He identifies five factors affecting of self-efficacy such as:

- (I). Experience or Enactive Attainment: The experience of mastery is the most important factor determining a person's self-efficacy. Success raises self-efficacy, while failure lowers it. According to psychologist Erik Erikson, "Children cannot be fooled by empty praise and condescending encouragement. They may have to accept artificial bolstering of their self-esteem in lieu of something better, but what I call their accruing ego identity gains real strength only from wholehearted and consistent recognition of real accomplishment, that is, achievement that has meaning in their culture."
- (II). Modeling or Vicarious Experience: Modeling is experienced as, "If they can do it, I can do it as well". When we see someone succeeding, our own self-efficacy increases; where we see people failing, our self-efficacy decreases. This process is most effectual when we see ourselves as similar to the model. Although not as influential as direct experience, modeling is particularly useful for people who are particularly unsure of themselves.
- (III). Social Persuasion: Social persuasion generally manifests as direct encouragement or discouragement from another person. Discouragement is generally more effective at decreasing a person's self-efficacy than encouragement is at increasing it.
- (IV). Physiological Factors: In stressful situations, people commonly exhibit signs of distress: shakes, aches and pains, fatigue, fear, nausea, etc. Perceptions of these responses in oneself can markedly alter self-efficacy. Getting 'butterflies in the stomach' before public speaking will be interpreted by someone with low self-efficacy as a sign of inability, thus decreasing self-efficacy further, where high self-efficacy would lead to interpreting such physiological signs as normal and unrelated to ability. It is one's belief in the implications of physiological response that alters self-efficacy, rather than the physiological response itself.
- (V). Perception of Ability: Whether your perception of ability is fixed or acquirable. If your perception of ability is fixed, you are less likely to increase self-efficacy whereas if you think ability is acquired and can change over your life, you are more likely to increase your level of self-efficacy.

Need and Significance of the Study

India is a country of large and diverse population. People belong to varied social differences like cultures, socio-

economic status, live at varied geographical locations and many more. When we think of educating such a diverse population and achieving the best results in education, we cannot simply rely upon old and traditional methods of teaching and learning. In modern time, collaboration is a philosophy of interaction and personal lifestyle where individuals are responsible for their actions, including learning and respect the abilities and contributions of their peers. In all situations where people come together in groups, it suggests a way of dealing with people which respects and highlights individual group members' abilities and contributions. Online Collaborative learning strategies in modern teaching helps the students to learn effectively in group which in turn inculcate among them various values like cooperativeness, tolerance, honesty, brotherhood etc. Students can achieve better results in economics by using online collaborative learning strategy. When they learn in group, they will be able to solve various problems by themselves. Also, the online collaborative learning techniques effects level of self-efficacy amongst students. The importance of this study is its contribution toward solving the problem of the low level self-efficacy of students. If the results of this study indicate that teaching by online collaborative learning methods can improve students' self-efficacy, it is hoped that this model will encourage policy-makers and teachers to apply it at primary and secondary levels. In the present study the effectiveness of online collaborative learning strategy is studied on achievement in economics in relation to self-efficacy as the investigator felt that there is a need that online collaborative learning strategy as an instructional strategy should be incorporated in schools because it has the potential to develop the various skills and abilities among students and make them better informed and high achievers. Therefore, investigator made an attempt to enquire the effect of online collaborative learning strategy on achievement in economics in relation to self-efficacy.

Objectives

1. To compare the achievement of groups taught through online collaborative learning strategy and conventional learning strategy in Economics.
2. To compare the achievement of students on self-efficacy on achievement in Economics.
3. To examine the interaction effect of online collaborative learning strategies and self-efficacy group on achievement in Economics.

Hypotheses

- H₁: The performance of achievement group will be significantly higher taught through online collaborative learning strategy and conventional learning strategy in Economics.*
- H₂: The performance of high self-efficacy group will be significantly higher than that of average and low self-efficacy group.*
- H₃: There will be significant interaction effect of online collaborative learning strategies and self-efficacy.*

Sample

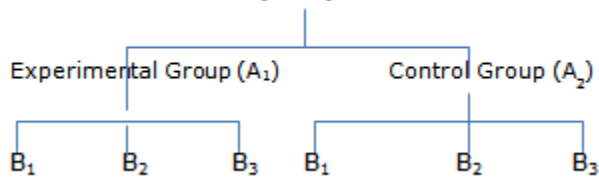
The present study was conducted on random sample of 120 Economics students of XI class of two English medium private schools with facility to teach through online collaborative learning strategy of Amritsar in Punjab affiliated to Central Board of Secondary Education, New Delhi. The two schools

were randomly selected from a list of schools of Amritsar. The sample included 60 students from Shri Guru Harkrishan Senior Secondary Public school, Amritsar and 60 students from Spring Dale Senior School, Amritsar. Further, from each school the two intact sections of 30 students were selected randomly to serve as experimental and control group.

Design

The present study will be experimental in nature. A pre-test and post-test factorial design will be employed. In order to analyze the data, Analysis of Variance (2x3) will be used. The experimental group will be taught through online collaborative learning strategy, whereas, the control group will be taught same topics with conventional teaching strategy by the investigators. The study will cover two independent variables such as instructional strategies and self- efficacy. The variable of instructional strategies will be examined at two levels, namely online collaborative learning strategy and conventional teaching strategy. The variable of self-efficacy group will be studied at three levels viz. high, average and low self-efficacy. These variables will work as independent variables. The dependent variable will be achievement in Economics, which will be calculated as the difference in post-test and pre-test scores for the subject. The schematic layout of the factorial design (2x3) is given below:

The schematic layout of the factorial design (2x3) (200)



Where:

A₁ Stands for Online Collaborative Learning Strategy

A₂ Stands for Conventional Teaching Strategy

B₁ Stands for High Self-Efficacy

B₂ Stands for Average Self-Efficacy

B₃ Stands for Low Self-Efficacy

Tools Used

The following tools were used for data collection:

- 1 General Mental Ability Test (1972) by [34] was used to access the intelligence of students for matching the group.
- 2 Self-Efficacy Scale by [35] was used.
- 3 An Achievement Test in Economics was developed by the investigators.
- 4 Instructional material for Online Collaborative Learning Strategy and Conventional Teaching Strategy on five topics such as Sectors of Indian Economy, Development, Money and Credit, Globalization and Indian Economy and Consumer Rights X class Economics subject were developed by investigators.

Procedure

After the selection of the sample and allocation of students to the two instructional strategies, the experiment was conducted in six phases. Firstly, the investigator made

necessary arrangements with the Principal of the school selected for experiment. Secondly, general mental ability test was administered for matching of groups. Thirdly, self-efficacy scale was administered in each school in order to identify the self-efficacy levels of the students. Fourthly, an achievement test in Economics as pre-test was administered to the students of experimental and control groups. The answer-sheets were scored to obtain information regarding the previous knowledge of the students. Fifthly, the experimental group was taught through online collaborative learning strategy and control group was taught through conventional teaching strategy by the investigators. Sixthly, after the completion of the course, the same achievement test in Economics as post-test was administered to the students of both the groups. The answer-sheets were scored with the help of scoring key.

Analysis and Interpretation of the Results

• Analysis of Descriptive Statistics

The data was analyzed to determine the nature of the distribution of scores by employing mean and standard deviation. The Analysis of Variance (2x3) was used to test the hypotheses related to online collaborative learning strategy, conventional teaching strategy and self-efficacy levels. The mean and standard deviation of different sub groups have been presented in table- 1, 2, 3 & 4

Table-1: Mean and SD of Gain Achievement Scores for the Different Self- efficacy Groups

Self Efficacy Group	Teaching Strategies						Total		
	Experimental Group			Control Group			N	M	SD
	N	M	SD	N	M	SD			
High Self-Efficacy	16	13.13	3.76	16	10.38	2.42	32	11.75	3.45
Average Self Efficacy	28	8.64	1.32	28	6.43	1.68	56	7.54	1.87
Low Self-Efficacy	16	6.38	0.86	16	3.63	0.60	32	5.00	1.56
Total	60	9.23	3.34	60	6.73	3.02	N=120		

Source: Filed Study, 2019

Table-1 observed that the mean gain scores of online collaborative learning strategy (M=9.23) is higher than the conventional teaching strategy (M=6.73). This shows that online collaborative learning strategy is more effective than that of conventional teaching strategy. It is also confirmed that the mean of the three group i.e. high, average and low self-efficacy group is 11.75, 7.54 and 5.00 respectively. It is concluded that the mean gain scores with online collaborative learning strategy has shown significant differences for high, average and low self-efficacy students. These differences are also found with respect of the different self-efficacy group taught through conventional teaching strategy.

• Analysis of Variance on Gain Achievement Scores

The mean of different sub-groups, sum of squares, degree of freedom, mean sum of squares and the F - ratio have been presented in table-2.

Table-2: Summary of Analysis of Variance (2x3) factorial designs

Source of Variance	Sum of Squares	df	Mean of SS.	F- ratio
Collaborative Learning Strategy (A)	187.51	1	187.51	46.07**
Self- efficacy (B)	750.04	2	375.02	92.07**
Interaction (AxB)	2.13	2	1.07	0.26
Error Term	464.29	114	4.07	

**Significant at 0.01 level

(Critical Value 3.93 at 0.05 and 6.86 at 0.01 levels, df 1/114)
(Critical Value 3.08 at 0.05 and 4.80 at 0.01 levels, df 2/114)

Collaborative Learning Strategy (A)

Table-2 reveals that the F-ratio for difference in mean gain scores of online collaborative learning strategy and conventional teaching strategy group is 46.07, which in comparison to the table value was found highly significant at 0.01 levels. Hence, the hypothesis H_1 : The performance of achievement group will be significantly higher taught through online collaborative learning strategy and conventional learning strategy in Economics, is rejected. The result indicates that the online collaborative learning strategy group was more effective than that of the conventional teaching strategy group in Economics. To probe deeper F-ratio was followed by t-test. The value of t-ratio for experimental and control group have been placed in table-3.

Table-3: t-ratio of mean gain achievement scores between experimental and control groups

Variable	Experimental Group			Control Group		SE _D	t-value	
	N	Mean	SD	N	Mean			SD
Gain Scores	60	9.23	3.34	60	6.73	3.02	0.58	4.31**

** Significant at 0.01 level

Table-3 reveals that mean gain achievement score of experimental group is 9.23, which is higher than the corresponding mean gain score of 6.73 for the control group. The t-value testing the significance of mean differences of online collaborative learning strategy and conventional learning strategy is 4.31, which in comparison to the table value (t 0.01=2.62, df 118) was found significant at 0.01 level. The result indicates that the achievement of online collaborative learning strategy group was more than that of the conventional teaching strategy group in Economics.

Self -Efficacy (B)

Table-2 shows that the F-ratio for difference in mean gain scores of the three groups of self-efficacy are 92.07, which in comparison to the table value was found highly significant at 0.01 level. It suggests that the three groups were different with respect to achievement scores. Hence, the hypothesis H_2 : The performance of high self-efficacy group will be significantly higher than that of average and low self-efficacy group, is accepted. The result indicates that the achievement of students taught through online collaborative learning strategy has significant differences for high, average and low self-efficacy groups in economics. To probe deeper, F-ratio was followed by t-test. The value of t-ratio for experimental and control group have been placed in table-4.

Table-4: t-ratio for different combinations of self-efficacy groups

Self-Efficacy Groups	High Self-Efficacy			Average Self Efficacy			Low Self-Efficacy		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
High Self-Efficacy	32	11.75	3.45	56	7.54	1.87	325.00	1.56	
Average Self Efficacy	-	-	-	-	-	-	-	-	-
Low Self-Efficacy	-	-	-	-	-	-	-	-	-

**Significant at 0.01 level

Table-4 shows that high self-efficacy group with mean of 11.75 exhibits higher mean gain score than average self-efficacy with mean of 7.54. The t-ratio for the difference in mean gain scores of high and average self-esteem groups is 6.43, which in comparison to the table value (t 0.01=2.63, df 86) was found significant at 0.01 level of significance. Hence, the hypothesis of significant differences is accepted in case of high and average self-efficacy irrespective of grouping across other variable. The result indicates that high and average self-efficacy groups were significantly different with respect to gain scores. Table-4 observes that high self-efficacy group with mean of 8.31 shows higher mean gain score than low self-efficacy group with mean of 3.63. The t-ratio for the difference in mean gain scores of high and low self-efficacy groups is 7.93, which in comparison to the table value (t 0.01=2.66, df 52) was found significant at 0.01 level of significance. Hence, the hypothesis of significant differences is accepted in case of high and low efficacy irrespective of grouping across other variable. This infers that high self-efficacy group performs significantly better than that of low self-efficacy group on achievement in economics with respect of gain scores. Table-4 reveals that average self-efficacy group with mean of 6.64 exhibits higher mean gain score than low self-efficacy group with mean of 3.63. The t-ratio for the difference in mean gain scores of average and low self-efficacy groups is 7.34, which in comparison to the table value (t 0.01=2.63, df 86) was found significant at 0.01 level. Hence, the hypothesis of significant differences is accepted in case of average and low self-efficacy irrespective of grouping across other variable. This infers average self-efficacy group performs significantly better than that of low self-efficacy group on achievement in Economics with respect to gain scores.

Interaction Effect (AxB)

Table-2 reveals that the F-ratio for the interaction between online collaborative learning strategies and self-efficacy groups is 0.26, which in comparison to the table value was found not found significant even at 0.05 level. It indicates that the two variables do not interact with each other. Thus, the hypothesis H_3 : There will be significant interaction effect of online collaborative learning strategies and self-efficacy, is accepted. The result indicates that there was no significant difference in gain scores on achievement in economics due to interaction effect of online collaborative learning strategy and self-efficacy groups. The online collaborative learning strategy and conventional learning strategy did not yield equal levels

of mean gain achievement scores for high, average and low self-efficacy for the students.

Discussions

The result of the present investigation has led to the conclusion that online collaborative learning strategy improved the achievement in Economics as compared to the conventional learning strategy. Hence, the hypothesis H_1 is accepted. The results are supported by the findings of [36] indicates superior effects of cooperative learning on achievement in social studies. [37] Found that competence of peer group has positive effect on achievement of students. [38] Indicated that online collaborative learning had a significant and positive effect on achievement of students. [39] found that achievement level of the students at the online problem-based learning group had higher than the students in the face-to-face problem-based learning group. [40] Found that online collaborative learning has positive effect on achievement. [41] Found that positive interdependence among students has positive effect on achievement in online learning environment. [42] Revealed that online collaboration enhances students' learning achievement. [43] found that online students are in greater need of higher-level social presence, which has a strong effect on their learning achievement and satisfaction. [44] Indicated that online collaborative learning method has a favorable effect on learning and achievement of students. [45] Indicated that collaborative learning strategy has favorable effect on achievement in mathematics of secondary school students in school hostels in rural areas. [46] Showed that achievement in Economics of the group exposed to collaborative concept mapping strategy was significantly more as compared to group taught by conventional method. [47] Found that the performance of collaborative learning strategy was more effective as compared to conventional teaching strategy on achievement in Economics. [48] Indicate that online collaborative learning has significant effect on achievement of students. [49] found out that collaborative learning approach has positive effect on academic achievement of the students in Turkish courses in comparison with traditional methods. [50] Revealed that online learning community revealed better performance in learning achievement and student engagement. The results are contradicted by the study of [51] who found that online learning did not lead to better performances of students. The present study reveals that high self-efficacy of experimental group is more effective than that of average and low self-esteem. Hence, the hypothesis H_2 is accepted. The results are supported by the findings of [52] who found that students who reported high self-efficacy for educational requirements achieved higher grades and persisted longer in technical and/or scientific majors over the following year than those with low self-efficacy. [53] Found significant improvement in attitudes toward technology, self-efficacy toward science, and modest, yet significant, improvements for geographic data analysis for students. [54] Indicated that performance-avoidance goals moderated the relation between self-efficacy and science achievement, indicating that self-efficacy has positive influences on achievement when students are not performance-avoidance oriented. [55] Reported that there exists significant difference between achievement of the students in a subject and self-efficacy. [56] revealed that mathematics self-efficacy of high school students should be

promoted to increase their achievement. [57] Found that higher self-efficacy significantly enhance the achievement. [58] Revealed that academic self-efficacy mediated the effects of perceived task goal structure, perceived ability structure, civic virtue, and sportsmanship on adolescents' academic achievement. [59] Found that significant relationship existed between research self-efficacy score and student's academic performance, improving the research self-efficacy will also increase students' academic performance. [60] Revealed that online learners who were immersed in a socially rich symbiotic learning environment throughout an online course demonstrated a significant increase in their academic self-efficacy and reached a higher level of self-efficacy compared to students in the control group. The performance of instructional strategy groups was not found interacting with different levels of self-efficacy each other. Hence, the hypothesis H_3 was rejected. The results are supported by the finding of [61] which indicates that there is no significant interaction effect of online collaborative learning strategy on achievement in relation to self-efficacy. [62] Found that there is no significant interaction effect of cooperative learning strategy on achievement in mathematics in relation to self-esteem. The results are contradicted by the findings of [63] who indicated that self-efficacy can promote student achievement via student interactions in an e-learning environment. [64] found that performance of group taught through collaborative learning strategy does interact with meta-cognition.

Findings

1. The achievement of students taught through online collaborative learning strategy was found more effective than that of taught through conventional teaching strategy group in Economics.
2. The mean gain scores of high self-esteem group were higher than that of average and low self-efficacy groups in Economics.
 - The mean gain achievement scores were found significantly higher for high and average self-efficacy group.
 - The mean gain achievement scores were found significantly higher for high and low self-efficacy group.
 - The mean gain achievement scores were found significantly higher for average and low self-efficacy group.
3. There was no significant interaction effect between online collaborative learning strategy and self-efficacy groups.

Conclusion

The present study reveals that online collaborative learning strategy gives better results than that of conventional teaching strategy for secondary school students. This could be because the students are able to do work in peer group. The students can themselves solve various problems with the help of their friends. Further, the self-efficacy affects the achievement of Economics students in online collaborative as well as conventional teaching strategy. The online collaborative learning strategies and self-efficacy produced did not significant interactional effect on achievement scores. The study recommends the use of online collaborative learning strategy for better achievement of secondary school students in Economics. The self-efficacy group of students seems to be a good predictor of achievement in Economics.

Hence, the appropriate guidance and training by teacher must be given to achieve good results.

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