**ORIGINAL ARTICLE**

**Effectiveness of Teaching Methods: Comparative Outcomes**

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**ABSTRACT:**

**Background:** Instructional methods play an important role in developing nursing education. The objective of this study was to compare the effectiveness of lecture, small group discussion and mixed method to teach childhood diarrhea topic among second year Proficiency Certificate Level (PCL) nursing students. **Methods:** Over a one year period, 60 PCL nursing students (second year) were divided into three groups and provided educational sessions on childhood diarrhoea. Three methods; a lecture, small group discussions and mixed methods (lecture plus small group discussion) were used separately. At the beginning, students were informed about a research study with process and questionnaires on the content of childhood diarrhea were administered to each student for pre-test. After the completion of sessions, post-test was done. They also completed a session evaluation ranged from 1 (Strongly Disagree) to 5 (Strongly Agree). Classroom observation result was collected by using “A 5-Point Likert Scale” ranging from 1(poor) to 5 (excellent) by the observer with feedback. The collected data were entered in MS Excel and analyzed using latest version of SPSS. **Results:** Lecture method was most significantly effective for gaining factual knowledge while small group discussion was most significantly effective for gaining insightful knowledge. However mixed method is most significantly effective for learning both the procedural and insightful knowledge. **Conclusion:** Nursing students learning about childhood diarrhoea preferred a mixed method of lecture and small group discussions (SGDs) over traditional lecture or discussion in groups. **Keywords:** Lecture, Small Group Discussion, Mixed Method, Instructional Methods

**INTRODUCTION**

In current nursing education, lecture method has been used as the main teaching method, especially in undergraduate education.¹⁷ Traditional lecture is one of the oldest and most widely used methods of teaching.¹⁰ Traditionally, the teaching in most Asian countries is dominated by a teacher-centered method.¹⁸ According to Allen, paradigm shift from the lecture method to one that uses a variety of approaches focused on stimulating students to think critically and, more specifically, to analyze and synthesize information.² Educators are shifting from teaching methods that promote passive learning to those that encourage active learning and include students in the educational process.³ According to Bonwell and Eison, group discussion is one of the most effective strategies for promoting active learning.³ Small group discussion, an alternative teaching method, may improve students’ critical thinking. In small groups, students have several opportunities to think, analyze, and evaluate the obtained new knowledge, and solve clinical problems which could enhance students’ critical thinking.²,⁵ Similarly, mixed method is that type of method which uses lecture coupled with SGDs.
Moreover, regarding the knowledge, there are two major types of knowledge: declarative knowledge ("knowing what" or factual knowledge) and Procedural knowledge ("knowing how" to perform activities). Knowledge of cognition usually is assumed to include three components cited by Burning et al. Insightful learning occurs very rapidly, is remembered for a considerable length of time and transfers readily to situations related to the one in which the insightful learning took place.

These findings support the assertion made by many educators that traditional lecture is not the most effective teaching method to promote critical thinking and problem-solving skills. Roche has also reported that by combining lectures with group tasks, the students’ attitudes towards the subject would become better more quickly.

Hypothesis of this study was ‘while teaching a topic on diarrhea to nursing students, the learning outcome following a ‘mixed’ method (i.e. lecture coupled with small group discussion) will be qualitatively much better compared to a similar outcome following either lecture or group discussion taken alone’.

The main objective of this study was to compare the effectiveness of lecture, small group discussion and mixed method to teach childhood diarrhea to the PCL second year nursing students.

METHODS

The study was designed as an intervention, descriptive and exploratory type because it describes the effectiveness of teaching method comparing between used methods. This study was done among 60 PCL second year nursing students (female) of Maharajgunj Nursing Campus (MNC) Institute of Medicine (IOM) of the Tribhuvan University (TU). The investigator formally obtained permission to carry out the study from MNC and informed consent was obtained from the participants. They were randomly divided into three groups A: traditional lecture, B: small group discussion and C: mixed method (lecture plus small group discussion). Three educational sessions of 90 minutes each excluding pre-test and post-test based on their teaching method were performed among these three groups. Performance guidelines were provided to the students in each group, which included the list of the content to be learnt and objectives of the class.

Two nursing teachers with years of teaching experiences were selected to conduct the sessions. The teachers were briefed about the objectives of the study. The teachers were also provided with the list of total objectives in relation to the topic on childhood diarrhoea. They also prepared guidelines to conduct the sessions. One teacher conducted the lecture session; the other conducted the small group discussion. During the “mixed” session, the first half was conducted by the same teacher who took lecture, and the second half by the one who organized small group discussion. The teachers had prior agreement on who should deal which objectives during the first and second halves of the session. Another teacher with many years of experience was selected to observe the delivery of the lecture, small group discussion and ‘mixed’ methods. She was oriented for the classroom observation.

Three types of instruments were designed and used in the study. This study used triangulation technique to minimize the subjectivity. The validity of the test contents were confirmed by three respectful pediatric doctors, nursing teacher and health professional educationist. Firstly, 16 open-ended questionnaires for pre-test and post-test were used to assess the knowledge of students in relation to the topic childhood diarrhoea at the beginning and end of each classroom session. Secondly, classroom observation tools were used to obtain first hand information for the researcher about the process of session delivery by using 1 (poor) to 5 (excellent). The teacher observed the delivery of each session using observation evaluation tools. Thirdly, session evaluation tools were used to get information at end of each classroom session on how much the topic was relevant and interesting to the students by using Likert’s scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree).

Before starting the actual intervention students were given necessary information for example, the students from lecture group were not allowed to mix up with the small group discussion group and the mixed group and vice versa. Students were not allowed to communicate between the three groups. No students were forced to participate and ethics were taken into consideration.

On the day of sessions, 20 students from each group A, B and C attended the sessions. Group A with 20 students was given a traditional lecture by a subject expert on the topic childhood diarrhoea for 90 minutes. The lecture was full-fledged covering all the subtopics of childhood Diarrhoea using a PowerPoint presentation. Furthermore, group B in the group discussion, students were divided into three subgroups of 6-7 students and they were guided by the teacher. Questions were given beforehand to the students. The students were given 45 minutes for the small group discussion and the same duration of time was given for group presentation and feedback. Similarly, in the group C “mixed” session, the first half 45 minutes was conducted by the same teacher who took lecture, and the second half 45 minutes by the one who organized small group discussion. The teachers had prior agreement on who should deal which objectives during the first and second halves of the session.

In all three sessions, teachers collected forms containing the pre-test questions with a 30 minutes time limit. At the end of the program, students completed a similar post-test as well as evaluation form. Altogether six students were dropped out from the pre and post test due to some personal reasons. Thus a total of fifty-four students participated in the study. The collected data were entered in MS Excel and analyzed using latest version of SPSS.
RESULTS

The section explains in short, the results in terms of student learning following the interventions by the three teaching methods. Next, it gives the scoring of the process of delivery, followed by feedback results by the participants as well as right and wrong responses by the students following intervention of three instructional methods. The results of the study were presented in table format. There were a total of 23 open ended items, by students of which 13 items represented factual knowledge, 4 items represented procedural knowledge and 6 items represented insights.

1. Define diarrhoea.
2. List the name of the types of diarrhoea.
3. List the high-risk (pre-disposing) factors leading to diarrhoea.
4. List the causes of diarrhoea.
5. List the complications of diarrhoea.
6. Define dehydration.
7. List the signs of severe dehydration.
8. List the signs of some (mild) dehydration.
9. Explain the degree of dehydration according to the given classification:
   - a) Severe dehydration.
   - b) Some dehydration.
   - c) No dehydration.
10. List the name of fluids to prevent dehydration.
11. List conditions when to take the diarrhoea patient to the health institution.
12. List the steps of preparing Jeevan Jal (ORS)
13. How much tea glass of Jeevan Jal (ORS) do you need to give to a Child under 2 years of age after passing each loose stool?
14. How much tea glass of Jeevan Jal (ORS) do you need to give to a child who is between the ages of 2 to 10 years after passing each loose stool?
15. How much tea glass of Jeevan Jal (ORS) do you need to give to a Child under 2 years of age after passing each loose stool?
16. List measures in the prevention of diarrhoea. In preventive measures include six sub answers according to the given content in the classroom such as
   - a) Improve weaning practice
   - b) Use safe water
   - c) Hand washing practice
   - d) Use of Latrine.
   - e) Measles Immunization
   - f) Breast feeding

a. Effects of intervention in general

In table 1, the pre-post test results of the three methods have been compared. Comparison between pre test-post test result in lecture group shows that in all 23 items (100 the number of right responses have increased. Likewise, in SGD group, out of the total 23 items in 8 items number of wrong responses following intervention have been increased, in 3 items it has remained same or slightly decreased. Thus, almost in 50% of total items, the students seem either confused or in the worst misled. In items three items none of the students from SGD group could bring right response either in the pre-test or in the post-test. Further, in the mixed group, except for 3 items, the number of wrong responses following intervention has decreased in all the rest 20 items. In three items, none of the students from the group could bring in right responses. In rest of the items, number of right responses has significantly increased following the intervention. Thus comparison of the three instructional methods based on the pre-test/post-test outcome results of students’ learning demonstrates the overall effectiveness of the lecture method. The SGD method seems to be the least effective among the three methods.

b. Categorization of response

A total number of 23 items in the Pre- and Post-test questionnaire, in 9 items representing the factual knowledge students who underwent the lecture intervention scored the highest correct responses; in 1 item representing the procedural knowledge student who underwent the ‘mixed’ intervention scored the highest correct responses; while in 2 items representing insight, the group discussion and the mixed method scored the highest correct responses.

The evidence shows that response to the question numbers 1, 3, 4,5,7,8,9a, 9b, 9c, 10and 11 demonstrates lecture methods to be the most effective compared to other two methods. Students from lecture group scored the highest numbers. Hence lecture seems to be the most effective method compared to the other two methods to learn the factual knowledge. Responses to the items numbers 15,16c and 16d demonstrate that the SGD is the most effective method compared to be other methods. Item number 15 represents the procedural knowledge whereas item numbers 16c and 16d represent the insight. Responses to item numbers 12, 13, 14, 16a, 16b, 16c and 16d demonstrated that the students from the lecture coupled with small group discussion (‘mixed’ group) scored the highest.

c. Item distribution

In 9 items the lecture method is most significantly effective for gaining factual knowledge. In 1 item the small group discussion method is most significantly effective for gaining insight, whereas, in 2 items ‘Mixed’ method is most significantly effective for learning both the procedural knowledge as well as the insight. In the remaining 11 items, there is no significant difference in the number of correct responses through intervention by the three methods.
d. Classroom Observation Result

a. Process of instructional delivery

The process of delivery of each instructional method was appropriate. Among three deliveries, lecture was given the highest score 98%. SGD was given the lowest 69.35%, the mixed method scored 86.4% (an average of SGD and lecture components).

b. Feedback from observers

Table 5 shows written feedback from the two independent observers about the extent to which the process of delivery was appropriate. Data from classroom observation report supports the positive impact of the lecture method through proper organization of seating arrangements, motivation of the students, structuring of the lesson, management of time, use of visual aids, audible voice, handling different types of students, promoting active participation and summarizing the session at the end. Therefore the Lecture session got the highest score 98.5% (Table 4).

The positive impact of the lecture method were expressed through managed time very well; explained objectives and gave related examples whereas, weak part on behalf of the teacher was that she did not check transparency before the session. Similarly, the small group discussion session received excellent scores in relation to the seating arrangement, audible voice and the handling different types of students. Small group discussion got 69.3% score (Table 4). This score is much smaller compared to the other two methods. The positive impact of the small group method is also implied by the strength of teacher identified in terms of ‘good voice’ during the delivery. Weakness of the teacher was that she did not explain the objectives clearly and did not summarize the session at the end. The teacher needs to improve further in terms of time management for the content, explaining the objectives before the session, demonstrating confidence in the method, giving clear feedback, correcting the mistakes and summarizing the session.

The positive impact of the small group discussion in mixed method is also implied by the strength of teacher identified in terms of ‘good voice’ during the delivery. Weakness of the teacher was not explaining clear objectives and not summarizing the session at the end. Data from classroom observation of the lecture part in mixed group shows that first half of the session received excellent score in seating arrangements, motivation of the students, structuring of the lesson, management of time, use of visual aids, audible voice, handling different types of students, promoting active participation and summarizing the session. The scores were marked excellent.

Mixed method got on an average 86.4% score (Table 4). The positive impact of the mixed method is also implied by the strength of teacher identified in terms of ‘explained objectives’ and ‘gave relative examples’ during the delivery, whereas, the weakness of the teacher was that she did not check transparency before the session.

c. Session evaluation from students

Table 6 shows an overview of session evaluation from the students’ result in the area of interesting, useful, relevant, clear objective, understand, learned a lot and sufficient time using Likert scale from 1=strongly disagree to 5= strongly disagree. Table 6 proved that 14 (82.3%) out of 17 students in the lecture group marked excellent in terms of to what extent subject matter was understandable. None of the students responded either strongly disagree or agreed. It was also found that 15 (83.3%) out of 18 students in the SGD group responded excellent in terms of to what extent subject matter was understandable. None of the students marked ‘disagree’. In the mixed group it was found that 16 (84.2%) out of 19 students secured excellent in terms of usefulness of the session. None of the students responded either strongly disagree’ or ‘disagree (Table 6).

d. Suggestions from students

Table 7 shows that 3 (17.8%) students from the lecture group suggested to show more audiovisual aid. From SGD group, 7 (38.8%) students suggested to increase time. From the mixed group, 4 (21.2%) students suggested to explain the objectives clearly.

DISCUSSION

Analysis of pre-test and posttest learning outcomes demonstrate that 9 out of total 23 items, students intervened through lecture, scored the distinctively highest number of correct responses. All 9 items constituted learning objectives representing the factual knowledge. This definitely confirms the superiority of the lecture method to impart factual knowledge to the students, compared to other two methods. Data obtained through the evaluative observations of the lecture session both by the independent observers and the students demonstrate that the session was most satisfactorily conducted. Using a five-point Likert scale, the independent observers assigned 98.5% score to the lecture session. More than 75% of students in the lecture group favored the session.

Current literature by Steinert & Snell; Sullivan et al.; support those findings and reiterate that lecture is highly effective to teach declarative knowledge to the students.15

Similarly, analysis of pretest-posttest learning outcomes demonstrate that in 1 out of a total 23 items, students intervened through small group discussion (SGD), scored the distinctively highest number of correct responses. The item constituted learning objectives representing the insight. Using a five-point Likert scale, the independent observers assigned 69.3% score to SGD session. This is quite low compared to the scores given to the other two methods. Although 83.3% students attending the SGD agreed that the
subject matter was understandable, 38.8% of the students suggested that time needs to be increased for the session. Feedback obtained through observation both by independent observers and students demonstrates that the conduction of SGD should be further improved and structured. According to Rathnakar et al., many studies SGDs contribute for deeper understanding, critical thinking, problem solving skills, and better student satisfaction. Most students preferred the small group discussion-based method over the traditional lecture-based method. Students strongly preferred SGD over lectures as the teaching-learning methodology. Small group discussion could increase students’ critical thinking, self-directed learning, and learning satisfaction.

Two out of 23 items, students intervened through mixed method scored the distinctively highest number of right responses. Out of these two items, one constituted learning objective belonging to procedural knowledge, the other constituted learning objectives belonging to insight. The independent observers assigned 86.4% scores to the ‘mixed’ session. This is comparatively higher than the score given to SGD but lower than that given to lecture. In 84% of students attending ‘mixed’ session responded excellent in terms of the usefulness of the topic. However, 21% of students also suggested that the teacher needs to explain the objectives more clearly.

Rest of 11 items no significant variations were found in students’ responses. The study’s focus was to find out through comparison which of the three instructional methods i.e. lecture, small group discussion and the ‘mixed’ (i.e. lecture coupled with SGD) was the most effective one to learn childhood diarrhoea by the nursing students. Pretest/posttest scores results obtained from 54 students were carefully analyzed and compared in relation to each of the three sessions using three different methods. Each session was assessed through the use of two additional tools namely classroom observation and session evaluation.

While comparing the final results in terms of student learning, it is evident that lecture method had the most significant positive impact on learning of factual knowledge by the students. However, lecture was the least effective in terms of learning either procedural or the insightful knowledge; it had some impact on learning factual knowledge. The ‘mixed’ method (lecture coupled with small group discussion) had significant positive impact on learning both procedural and insightful knowledge by the students. It also had some impact on learning factual knowledge. Hence, it could be argued that among, the three instructional methods, the ‘mixed’ method was the only methods which had impact on all three types of knowledge i.e. factual, procedural and insight. In this regard, the ‘mixed’ method is qualitatively much better than the other two while teaching a topic or diarrhoea for the PCL nursing students. Thus the analysis of the result has supported the original hypothesis of the study.

LIMITATIONS

1. The study had not included performance skill such as how to prepare ORS by individual student independently.
2. The study had not included communication skill of the nursing students in teaching the mothers in preparation of ORS. Value of small group discussion would have been made clearer if such skills were included.
3. Since teachers have predominantly used the lecture method with emphasis on knowledge objectives, they were not equally competent in small group discussion for experimental comparison.

CONCLUSION

No single instructional method is perfect while one single method as significant strength in one aspect, it could be weak in other aspects. Hence, combining two or more methods could help to ameliorate the weaknesses to achieve a complete a goal. On the other hand, a differentiated approach in the selection of appropriate method to achieve the specific types of objectives could be another strategy to achieve the goal of the curriculum. In both cases, nursing teachers need to be trained to be competent to utilize in practice all three types of methods. This will provide better option to select the best strategy in other to achieve the goals of the nursing curriculum. On top of the above, it is recommended that:

- Adequate time should be given to teach the topic on childhood diarrhea.
- Content should be categorized according to the factual, procedural and insightful knowledge, and teaching methods should be selected accordingly.
- In both cases, teachers should be trained to be competent to utilize in practice all three types of methods. This will provide better option to select the best strategy in other to achieve the goals of the nursing curriculum.
- PCL nursing curriculum needs to be reviewed so that the objectives, content and the appropriate teaching methods should match to each other.

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ABBREVIATIONS: Not Applicable

CONFLICT OF INTEREST: Author declares that there is no conflict of interest.

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### Table 1: Pre-/Post-test results showing no. of right (R) and wrong (W) responses by the students following the interventions

| Intervention | Lecture | SGD | Mixed | Mixed |
|--------------|---------|-----|-------|-------|
| Test         | Pretest | Posttest | Pretest | Posttest | Pretest | Posttest |
| Item no.     | W | R | W | R | W | R | W | R | W | R |
| 1.           | 17 | 0 | 0 | 17 | 18 | 0 | 18 | 0 | 19 | 0 |
| 2.           | 21 | 0 | 0 | 17 | 21 | 0 | 0 | 18 | 17 | 0 |
| 3.           | 19 | 49 | 0 | 138 | 17 | 54 | 13 | 122 | 7 | 55 |
| 4.           | 59 | 0 | 15 | 125 | 59 | 0 | 58 | 63 | 56 | 2 |
| 5.           | 16 | 0 | 0 | 51 | 12 | 20 | 11 | 54 | 16 | 29 |
| 6.           | 8 | 0 | 0 | 17 | 8 | 0 | 0 | 18 | 10 | 0 |
| 7.           | 33 | 15 | 9 | 70 | 20 | 36 | 34 | 58 | 32 | 29 |
| 8.           | 42 | 17 | 0 | 67 | 31 | 24 | 23 | 48 | 48 | 27 |
| 9A.          | 26 | 0 | 4 | 15 | 24 | 0 | 49 | 0 | 29 | 0 |
| 9B.          | 7 | 0 | 2 | 15 | 12 | 0 | 21 | 0 | 19 | 0 |
| 9C.          | 4 | 0 | 0 | 17 | 11 | 0 | 0 | 0 | 14 | 0 |
| 10.          | 18 | 85 | 3 | 125 | 11 | 88 | 13 | 89 | 23 | 90 |
| 11.          | 45 | 26 | 13 | 65 | 29 | 27 | 51 | 52 | 47 | 37 |
| 12.          | 41 | 66 | 28 | 74 | 40 | 69 | 45 | 79 | 42 | 80 |
| 13.          | 4 | 16 | 0 | 17 | 5 | 10 | 0 | 18 | 8 | 2 |
| 14.          | 5 | 11 | 0 | 17 | 8 | 7 | 0 | 18 | 10 | 5 |
| 15.          | 6 | 5 | 0 | 17 | 4 | 2 | 0 | 18 | 3 | 4 |
| 16a.         | 0 | 39 | 1 | 45 | 3 | 29 | 1 | 49 | 0 | 44 |
| 16b.         | 0 | 15 | 0 | 20 | 0 | 20 | 0 | 26 | 0 | 30 |
| 16c.         | 2 | 26 | 2 | 30 | 5 | 23 | 0 | 43 | 2 | 32 |
| 16d.         | 17 | 5 | 14 | 21 | 14 | 4 | 21 | 21 | 21 | 5 |
| 16e.         | 0 | 1 | 0 | 11 | 0 | 2 | 0 | 15 | 0 | 1 |
| 16f.         | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 12 | 0 | 0 |

### Table 2: Categorization of response items based on the type of knowledge.

| Number of items | Lecture | SGD | Mixed | Types of K |
|-----------------|---------|-----|-------|------------|
| 1. Define diarrhoea | 17 | 0 | 0 | F.K |
| 2. Name types of diarrhoea | 17* | 18* | 19* | F.K |
| 3. High risk factors leading to diarrhoea | 89 | 68 | 64 | F.K |
| 4. Causes of diarrhoea | 125 | 63 | 124 | F.K |
| 5. Complications of diarrhoea | 51 | 34 | 28 | F.K |
| 6. Define dehydration | 17* | 18* | 19* | F.K |
| 7. Signs of severe dehydration | 55 | 22 | 40 | F.K |
| 8. Signs of some dehydration | 50 | 24 | 46 | F.K |
| 9. A Degree of dehydration sever | 15 | 0 | 0 | F.K |
| 9B. Degree of dehydration some | 15 | 0 | 0 | F.K |
| 9C. Degree of dehydration no | 17 | 0 | 0 | F.K |
| 10. Name of fluid to prevent dehydration | 40 | 1 | 10 | F.K |
| 11. Conditions when to take the diarrhoea patient to the health institution | 39 | 25 | 28 | F.K |
| 12. Steps of preparing Jeevan Jal (ORS) | 8 | 10 | 21# | P.K |
13. How much tea glass of J.J (ORS) do you need to give child under 2 yrs. of age?

14. How much tea glass of J.J (ORS) do you need to give between ages of 2-10 yrs. of age?

15. How much tea glass of J.J (ORS) do you need to give who is 11yrs or old?

16a. (Measures in the prevention of diarrhoea) Improve weaning practice

16b. Use safe water

16c. Hand washing practice

16d. Use of Latrine

16e. Measles Immunization

16f. Breast feeding

Note:

1. Plain bold sign number means = highest effective in among the three methods
2. Bold & underline number means =highly effective in small group discussion method
3. Bold # sign number means =highly effective in’ mixed’ method
4. Bold* = similarly effective in all three methods.

Note: F.K= Factual Knowledge, P.K= Procedural Knowledge, I= Insight (Insight deeper level of course, you need facts, but you have to know how to integrate them). J.J= Jeevan Jal (ORS).

Table 3: Item distribution based on type of intervention and knowledge types (Out of a total number of 23 items).

| Items type | Lecture | SGD | Mixed | Types of K |
|------------|---------|-----|-------|------------|
| Factual    | 9       | 0   | 0     | P.K        |
| Procedural | 0       | 0   | 1     | Insight    |
| Insight    | 0       | 1   | 1     | Insight    |

Note: The figures represent the total number of items falling under each method in which the students scored the highest number of correct responses; hence the particular knowledge type was most effectively addressed by that particular method. The items are selected on the basis of a difference among aggregate group scores by a minimum of 10 points or more.

Table 4: Observation from process of instructional delivery

| S.N. | Statements                  | Lecture | SGD | SGD in Mixed | Lecture in Mixed |
|------|-----------------------------|---------|-----|--------------|------------------|
| 1.   | Setting arrangement         | 5       | 5   | 5            | 5                |
| 2.   | Gaining attention           | 4       | 4   | 4            | 4                |
| 3.   | Motivation of the students  | 5       | 4   | 4            | 5                |
| 4.   | Structuring of the lesson   | 5       | 4   | 4            | 5                |
| 5.   | Time spent on different content area | 5 | 3 | 3 | 5 |
| 6.   | Use of visual aids/real objects | 5 | 3 | 3 | 5 |
| 7.   | Voice audible               | 5       | 5   | 5            | 5                |
| 8.   | Handling different type of students | 5 | 5 | 5 | 5 |
| 9.   | Emphasizing the important points | 4 | 3 | 3 | 4 |
| 10.  | Confident in subject matter | 4       | 3   | 3            | 4                |
| 11.  | Clarifying doubts           | 4       | 2   | 2            | 4                |
| 12.  | Promoting active participation | 5 | 3 | 3 | 5 |
| S.N. | Statements                        | Lecture | SGD | SGD in Mixed | Lecture in Mixed |
|------|----------------------------------|---------|-----|--------------|------------------|
| 13.  | Feedback given                   | 4       | 3   | 3            | 4                |
| 14.  | Evaluating the students          | 4       | 2   | 2            | 4                |
| 15.  | Summarize at the end of class    | 5       | 3   | 3            | 5                |
|      | **Total**                        | **69 (98.5%)** | **52 (69.35%)** | **52 (69.35%)** | **69 (98.5%)** average **86.4%** |

**Note:** Total highest possible score from 15 items is 75 (15*5). Note: Two observers scored similar evaluation in Table 6. The key to Likert scale as follows; 1= poor, 2= needs improvement, 3= satisfactory, 4= very satisfactory and 5= excellent.

**Table 5:** Strength and weakness in the delivery of instructional methods

| Methods                | Strength                                                                 | Weakness                                                                 |
|------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Lecture                | • managed time very well                                                 | • no checking of transparency before the session                          |
|                        | • explained objectives                                                   |                                                                         |
|                        | • gave related examples                                                  |                                                                         |
| SGD                    | • good voice                                                             | • no management of teaching materials                                     |
|                        | • equal division of content for three group students                     | • not conscious of time                                                   |
|                        |                                                                         | • did not explain objectives clearly                                       |
|                        |                                                                         | • did not clarify mistakes during the session                              |
|                        |                                                                         | • did not summarize the session                                           |
|                        |                                                                         | • did not prepare transparency for the difficult content                   |
| Lecture in Mixed       | 1. managed time very well                                               | • transparency not checked before class teaching                           |
|                        | 2. explained objectives                                                  | • no confidence in SGD method                                              |
|                        | 3. gave related examples                                                 | • no conscious of time                                                     |
| SGD in Mixed           | a. Good voice                                                           | • did not know to explain objectives clearly                               |
|                        |                                                                         | • did not clarify mistakes during the session                              |
|                        |                                                                         | • did not summarize the session                                           |

**Note:** Two observers gave similar feedback in the process of instructional delivery of methods in the Table 5.

**Table 6:** Session evaluation analysis chart

| S. N. | Statements                  | Lecture | SGD | Mixed |
|-------|----------------------------|---------|-----|-------|
| 1     | interesting                | 1 (5.8%)| 4 (23.5%) | 12 (70.5%) | 12 (66.6%) | 6 (33.3%) | 6 (31.5%) | 13 (68.4%) |
| 2     | Useful                     | 1 (5.8%)| 4 (23.5%) | 12 (70.5%) | 12 (66.6%) | 6 (33.3%) | 3 (15.7%) | 16 (84.2%) |
| 3     | relevant                   | 1 (5.8%)| 8 (47.1%) | 8 (47.1%) | 6 (33.3%) | 12 (66.6%) | 7 (36.8%) | 12 (63.1%) |
| 4     | clear objective            | 1 (5.8%)| 8 (47.1%) | 8 (47.1%) | 1 (5.5%) | 1 (5.5%) | 5 (27.7%) | 6 (33.3%) | 10 (55.5%) | 1 (5.2%) | 5 (27.7%) | 1 (5.2%) | 13 (68.4%) | 4 (21.0%) |
| 5     | understand                 | 1 (5.8%)| 2 (11.7%) | 8 (47.1%) | 1 (5.5%) | 1 (5.5%) | 1 (5.5%) | 1 (5.5%) | 15 (83.3%) | 1 (5.2%) | 1 (5.2%) | 1 (5.2%) | 13 (68.4%) | 4 (21.0%) |
| 6     | learned a lot              | 2 (11.7%)| 6 (35.3%) | 9 (52.9%) | 1 (5.5%) | 1 (5.5%) | 4 (22.2%) | 12 (66.6%) | 1 (5.5%) | 1 (5.5%) | 1 (5.5%) | 10 (52.6%) | 7 (36.3%) |
| 7     | sufficient time            | 1 (5.8%)| 8 (47.1%) | 9 (52.9%) | 1 (5.5%) | 1 (5.5%) | 6 (33.3%) | 10 (55.5%) | 1 (5.2%) | 1 (5.2%) | 2 (11.1%) | 6 (31.5%) | 9 (47.3%) |

**Note:** Total no. of respondents in lecture group = 17, SGD group = 18, mixed group = 19

1 = Strongly disagree, 2 = disagree, 3 = agreed not disagree (neutral option) 4 = agree 5 = Strongly agree.

**Table 7:** Suggestions given by the students

| Methods   | Suggestions                  | No. of students |
|-----------|------------------------------|-----------------|
| Lecture   | Need to demonstration of J.J (ORS) | 1 (5.8%) |
|           | Need to show more audio visual aids | 3 (17.6%) |
|           | Very interesting & useful session | 13 (76.4%) |
| Methods | Suggestions                                      | No. of students |
|---------|-------------------------------------------------|----------------|
| SGD     | Advice to discuss new topic like AIDS in future | 1 (5.5%)       |
|         | Limit time                                      | 7 (38.8%)      |
|         | Need to show real object & visual aids          | 1 (5.5%)       |
|         | Need to implement in different faculty as soon as possible | 2 (11.1%) |
|         | Not responding                                  | 6 (33.3%)      |
|         | Need to make clear objectives                   | 1 (5.5%)       |
| Mixed   | Need to provide book at the time of discussion  | 1 (5.2%)       |
|         | Need more time in future                        | 2 (10.5%)      |
|         | Need to do demonstration of J.J (ORS)           | 1 (5.5%)       |
|         | Need more pre planning                          | 3 (15.7%)      |
|         | Objective was not clear                         | 4 (21.0%)      |
|         | Not responding                                  | 8 (42.1%)      |