EVALUATION OF THE EFFECTIVENESS OF TWO STUDENT-CENTERED METHODS OF TEACHING AS PEDAGOGICAL STRATEGIES ON TERTIARY INSTITUTION STUDENTS' ACADEMIC ACHIEVEMENT IN MEASUREMENT AND EVALUATION

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Abstract

The objective of this study was to evaluate the effectiveness of two students-centered methods of teaching and conventional instructional method as pedagogical strategies on tertiary institution students' academic achievement in measurement and evaluation. A sample of 192, 200 level students were drawn across three colleges of education in South-west, Nigeria and were used for the study. Students' achievement test in measurement and evaluation, lesson plan, a collaborative learning guide and individualized instructional techniques guide were the instruments used for data collection. Mean, t-test and analysis of co variance (ANCOVA) were used for data analysis. The result indicates significant differences on the effectiveness of the three teaching methods (collaborative learning, individualized instruction techniques and conventional method). The post-test mean scores showed that collaborative learning and individualized instructional techniques had effect on students performance in measurement and evaluation and that the performance of students taught with collaborative learning and students that were exposed to individualized instructional techniques was superior to the performance of students taught with conventional method with (73.19, 72.19 and 53.94). It was also revealed that teaching methods had significant effect ($p > .05$) on students performance in measurement and evaluation ($F = 404.950$) was greater than the critical value of 2.30. The mean score results demonstrated that collaborative learning was the most effective pedagogical strategy followed by individualized instructional techniques while conventional instructional method was the least

effective pedagogical strategy. Based on the findings, the following recommendations were made; measurement and evaluation lecturers should adopt the use of collaborative learning and individualized instructional techniques, Administrators of higher institution should teach their lecturers on the use of this new strategies and that usage of conventional instructional method should be minimized.

Keywords: Student-Centered, Pedagogical strategy, tertiary institution students, academic achievement.

Introduction

Education is very important in Nigeria and in every country for it contributes to the political, social and economic development of every community. More so, education is a basic human right and it is a basic instruction for achieving the goal of national unity, political stability. In addition, education is the process of facilitating learning, knowledge, skills values beliefs and habits assumed to a group of people which are transfer to other people through discussion, storytelling, training and teaching and the best that is commonly used is teaching. Therefore, knowledge can be effectively acquired by students through teaching.

Teaching is a continuous process that involves bringing about desirable change in students through the use of appropriate teaching methods. As indicated by Adunola (2011), to bring desirable changes in students, teaching methods used by the lecturers should focus on the students' needs. Since every students interpret and responds to questions in a unique way.

The main objective of teaching at any level of education according to Ganyaupful (2013) is to bring a critical and meaningful change in the students. To Harman and Nguyen (2010), the major aim of teaching learning process is achievement in terms of grades, as it is sole measure of learning in many cases. To achieve this target, lecturers use diverse teaching methods, including lecture, discussion demonstration, inquiry, team-teaching project, co-operative learning, individualized instruction, on-line instruction programme, automated instruction, role playing tutoring and many others. Therefore to facilitate the process of knowledge transmission, lecturers should apply appropriate teaching methods that best suit specific objectives and level.

Mambeh (2008) viewed teaching methods as those techniques and strategies used by lecturer in their efforts to facilitate learning. It is an activity that translates curriculum goals and objectives into experience that students acquire during their interaction with their lecturer. Therefore, the ability of the lecturer in using the appropriate teaching strategies will go a long way to improve students' academic achievement.

In any teaching-learning situation information is being processed by lecturer and students or by teacher and the students. The lecturer in higher institutions tries to present material which he/she understands in a way in which students will also understand. However, it is unlikely that anyone can transmit material from his understanding to the understanding of another person intact.

The current view is that, knowledge has to be constructed as it passes from one person to another. Therefore, if teaching and learning process will be effective in tertiary institutions, the presentation of what the students must understand should be presented in such a way that the student needs, interest and aspirations will be considered so as to enhance effective student academic achievement.

Academic achievement of the students is the extent to which the student has achieved his short term and long term educational goals, cumulative GPA and composition of educational degrees such as bachelor degrees. Academic achievement is commonly measured through examination or continuous assessments but there is general agreement on how it is best evaluated or which aspects are most important (Castelli, Hillman ,buck and Erwin 2007).Student's achievement measures the amount of academic content a student learn in a determined amount of time. Students achievement will increase when quality of teaching methods are used to teach the students.

In tertiary institutions such as universities, polytechnics, colleges of education and others, there are many strategies that are used to implement teaching and learning process. Those teaching strategies can be classified into two, teacher-centered and students centered.

Hayes (2000) defined teacher- centered instructional strategy as the method that its component involved traditional instruction where the teacher lectured, use the textbook and promotes discussion. He further stressed that, this method focus on teacher. The teacher talks while the student listens, the teacher monitors and corrects every student utterance, the teacher chooses topics and evaluates student learning. It can be referred from the above submission that,

under this method, students simply obtain information from the lecturer without building their engagement level with the subject or course being taught. The approach is least practical, more theoretical and memorizing (Teo and Wong 2000). It does not apply activity based learning to encourage students to learn real life problems based on applied knowledge. In this method, the teacher or lecturer controls the transaction and sharing of knowledge, the lecturer may attempt to maximize the delivery of information which minimizing time and effort. As a result, both interest and understanding of students may get lost.

Student centered method of teaching on the other hand is a method that enhance active learning (Greatzer & Shad, 2007). This teaching method is regarded as more effective since it does not centralize the flow of knowledge from the lecturer to the students (Lindquist, 1995). This approach is also motivated goal-oriented behavior among students, hence the method is very, effective in improving students academic achievement (Slainvin,1996).

Among the students centered method of teaching used in higher institutions to impact knowledge, skills and change of attitudes on students are team-teaching, collaborative learning individualized instructional techniques and many others. Therefore, this study aims at evaluating the effectiveness of team-teaching, collaborative learning and individualized instructional techniques as pedagogical strategies on tertiary institution of students' academic achievement in measurement and evaluation.

Conventional instructional method involves a formal discourse or exposition on a subject matter to attain a stated instructional objective, the teacher does the talking which the learners listen and occasionally take notes (Ukcho and Eneogive,1996). Okoro (1995) asserted that in lecture method, the teacher or some other knowledgeable person supplies information to students. Awotua Efebo (2003) explained that conventional instructional method is a method of teaching whereby the teacher transmits information (subject matter content) verbally to the students. Sometimes it involves writing on the chalkboard or using instructional materials. The students listen and take notes of facts that are considered important; sometimes the students are allowed to ask questions for clarification. According to Aguele (1997) the conventional instructional method is a traditional instructional strategy in which knowledge flows from the teacher to the student. Conventional instructional methods may include recitation, dramatization and others. It is a teacher-centered method. This method makes

the students inactive, uncreative, gullible and narrow minded. Conventional instructional method is probably one of the oldest methods of teaching (Bilesanmi, 2000). It is also a traditional type of method. The teacher conducts him/herself as the custodian of knowledge which he/she dishes out inform of ideas, opinions, and information and backs them up with citations of reputable authors. It is characterized by teacher dominance and little or no student participation. Conventional method turns the teacher and the students into deposition and receptor respectively where in the teacher functions as a depositor and students the receptors who only receive file and store deposits.

Collaborative learning according to Ozokeraha (2009) is the teaching strategy in which small teams each with students of different levels of ability use a variety of learning activities to improve the understanding of a subject. Collaborative learning is a method of teaching that involves students in learning process in order to understand and learn content of the subject (Slavin, 2011) collaborative learning (sometimes called cooperative learning can be described as learning which occurs as a result of interactions between members of a collective (meaning two or more individual. Collaborative learning is deemed highly desirable because of its tendency to reduce peer competition and isolation) and to promote academic achievement and positive inter relationships (Ibrahim, 2011) Zafrain (2002) explained collaborative learning as a technique that encouraged individual participation and is applicable across all grade levels and class sizes. He stressed further that students think through questions; student should work with one another in small groups, which is in a non-competitive fashion to accomplish a goal; He retreated that student inevitably identify a problem and the gap that exists between the identified problem and the solution, to give a clear direction of the problem solving process. From the submission of Kolawole (2007) collaborative learning is an approach that involves two one more individuals coming together to understand a common learning concept and complete a common task. Such an exercise is not to keep teachers or lecturers away from students learning process but to nudge student to resort to their own wisdom as a community. Talcon and Hasan (2018) cap it all that, collaborative learning is a way for students to help each other in learning academic content by working together in small groups.

Individualized instructional strategy is another student-centered pedagogical strategy that is highly flexible system of multiple materials and procedures in

which the student is given substantial responsibility for planning and carrying out his own organized programme and in which his progress is determined solely in terms of those plans (Copple and Bredekanip, 2009). Taiwo (2003) also described individualized instruction as those classroom practices of teaching which recognize the uniqueness of each subject and this provide adequate tutorial guidance and either support sited bring about a wholesome development in the persons. In the view of Lagoke, Taiwo and Ojebisi (2010) individualized instruction consists of any steps taken in planning and conducting programme of studies and lesson that suit individual student's learning, readiness and student characteristics. From the above, it can be inferred that individualized instructional technique is a total educational programme that incorporates all useful concepts known to enhance learning process. Its success depends upon an optional balance between the student's own self appraisal and the teacher's counsel. In order words, to individualize instruction for higher institution students is to recognize higher instruction student varying background, knowledge, readiness, language-preferences in learning, interest and react responsively. The intent of individualizing instruction among tertiary institution students will enable the lecturers to maximize each student's growth and individual success by meeting each student where he or she is and assisting in the learning process. It also provides the opportunity for students to learn at their own pace, in their own way and be successful. In his contribution to the meaning of individualized instruction technique Musograve (2000) explained that individualized instruction is a cycle that involves knowing individual student, implementing effective instructional strategies, and determining whether or not the choices made resulted in child learning. Here, pupils are taught individually and systematically small steps, the tasks to be learnt were broken down into steps and arranged in sequential order from an observation in the former in which participants responded since each pupil has varying needs and interests.

Statement of the Problem

The poor performance of higher institution students especially colleges of education students in measurement and evaluation has been a great concern to stakeholders in education. This poor performance is likely to be caused by some factors such as the instructional strategies used by the course lecturers, socio-

economic status of their parents, phobia for calculation, delayed in cognitive development and instructional resources and many other factors but the major contributing factor is the methods of teaching in Nigeria tertiary institutions which are based on the behavioural learning theories which are content drive, not learner-centered and do not sufficiently give students the opportunities to participate in the lecture room instruction. Students taught with methods based on the behavioural theories do not sufficiently retain their learning and apply it to new situations. As a result, different innovative instructional techniques were incorporated into the teaching and learning process among which project method, inquiry method, discussion method, computer assisted instructional technique, team-teaching, corroborative learning, individualized instructional technique. It is on this note, that the researcher intend to find out the effectiveness of two of these students centered instructional strategies.

Purpose of the Study

The purpose of this study was to determine the effectiveness of the student-centered instructional technique (conventional, corroborative learning and individualized instructional technique on tertiary institution students' academic achievement in measurement and evaluation.

Significance of the Study

It is hoped that this study would be immense benefit to the government at all levels, curriculum planner, educational administrators, researchers, lecturers, and students in higher institutions who are offering measurement and evaluation.

The research findings would help curriculum planners and educational administrators in the higher institutions to observe more clearly the conditions and circumstances under which the three instructional method can be used.

The findings would also help in identifying differential effects of the three instructional techniques on higher institution students' academic achievement in measurement and evaluation.

The findings of this study would open avenues for research on related theme. It would also provide basic research materials and methodology for other researchers who have interest in the area of this study. This study would help to

induce other researchers into different instructional studies and thus filling some of the many gaps which will exist in our knowledge of nature of instruction. The findings of this study would be beneficial to the students since the findings would relate to the areas of teaching and learning thus generating principle that have functional value to the lecturers to teach well and under which all students learn as efficiently as their talent permit.

Research Questions

The below research questions guided the study:

- Is there any significant difference in the academic achievement of higher institution students in measurement and evaluation using collaborative learning, instructional techniques and conventional using instructional method.

Hypotheses

There is only one hypothesis tested at 0.05 level of significance

There is no significant mean effect of collaborative learning individualized instructional techniques and conventional instructional method on academic achievement of higher institution students.

Methodology

Research Design

The study adopted a pre-test, post-test control quasi experimental research design where the researcher manipulated the independent variables (collaborative learning and individualized instructional techniques) to improve Emmanuel Alayande College of Education, Oyo, Federal College of Education Special (Sped), Oyo and College of Education, Lanlate student(s) academic achievement in measurement and evaluation. The study is non-equivalent control.

Sample and Sampling Techniques

As a requirement of the quasi experimental design at least the researcher must randomly assign one of the independent variables (Aguele, 2004). In this study, the researcher randomly assigned the instructional methods. With reference to Olaitan and Nwole (1988), pre-test, post-test, quasi experimental research design is schematically shown as follows:

Group	Pre-Test	Independent Variable	Post-Test
E1	01	X	02
E2	01	X	02
C	01		02

Where:

E1   represents experimental treatment group one

E2   represents experimental treatment group two

C   represents control group

01:     represents pre-test observation for the three group

X   represents experimental treatment indicates the experimental group and control group which are the intact classes

Population of the Study

The population of the study consisted of all the 200 level measurement and evaluation students during the 2018/2019 academic session of Emmanuel Alayande College of Education, Federal College of Education Special (Sped), Oyo and the College of Education, Lanlate.

Sample and Sampling Techniques

The study sample consisted of 192, 200 level students who offered measurement and evaluation during 2018/2019 second semester in Emmanuel Alayande College of Education, Federal College of Education Special (Sped), Oyo and the College of Education, Lanlate.

Instruments for Data Collection

The following instruments were used for data collection in this study:

1. The measurement and evaluation achievement test designed by the researcher (MEAT)

   The MEAT was the instrument used for collecting data for the study. It is a paper and pencil test of 40 items with four-options (A to D) multiple choice objective test which were used for both pre-test and post-test. The pre-test was used to establish the level of achievement at which the students performed in measurement and evaluation prior to the treatment. At the end of the treatment, the post test was conducted. It was

used to establish the level of performance at which the students attained in measurement and evaluation after treatment.

The Achievement test was subjected to face and content validation. The content validity of the test was established by drawing the items (initial and final pool) strictly in line with the table of specification to ensure that questions were set from all parts of the topics, that the number of questions set in each section reflect the relative importance of each section. An initial pool of Eighty items were drawn based on the table of specification and was validated by the researcher and two other measurement and evaluations in the Curriculum and Instruction Department, School of Education, Emmanuel Alayande College of Education, Oyo. It entailed checking of the test items against the topic and content of the lesson plan. Modifications where made on some of the items, before trial testing. After trial testing on 40 students, the test scores were subjected to item analysis to further consolidate the content validity and psychometric characteristics of the items using Kuder Richardson's formula 20 (KR-20) which was considered to be reasonably high.

2. Material for Treatment

    Three types of lecture room procedures for the teaching of the selected contents for this study were adopted. These are Collaborative Learning Guide (CLG) for lecturers and students, Individualized Instructional Guide (IIG) and Conventional Teaching Method Lesson Plan (CTMLP). Each of the procedures consisted of six planned lessons for each treatment group. All groups were similar in content, lesson objectives, duration of lesson and evaluation of learning outcomes. However, while collaborative learning and individualized instructional techniques used different instructional methods, the control group only used the conventional instructional method.

    These guides were given to the participating teachers and students so as to ensure that the guiding principles were adhered to and the conditions for the methods are fulfilled.

Procedures of Data Collection

In order to compare the effects of collaborative learning, individualized instructional techniques and conventional teaching strategy in fostering students

achievement. A factorial design within a pre-test, post-test control group experimental design (non-equivalent groups) was used.

School of Education 200 level students in each of Emmanuel Alayande College of Education, Federal College of Education Special (Sped), Oyo and the College of Education, Lanlate were purposively sampled and used for the study. Out of the three intact college, one served as the first treatment or experimental college, which received instructions using collaborative learning. Another college of education also received instructions using individualized instructional techniques and this served as the second experimental group. The remaining college of education in the three college of education where students received instructions using the conventional instructional method. This was the control group.

Prior to the commencement of treatment, all students were subjected to a pre-test in order to obtain the pre-test scores for the study. The administration of this pre-test took place a week before treatment began in all the three colleges of education.

The researcher visited the sampled colleges of education to seek for permission from the authorities concerned for the involvement of their institutions in the study. Three weeks before the commencement of the treatment, each participating lecturers received detailed instructional procedures and content summary of the topics as it applied to his or her instructional method. A week later, a second training was held for the measurement and evaluation lecturers who taught in the two experimental groups according to their instructional methods. A schedule for the administration of treatment was drawn and agreed upon by the participating lecturers.

Method of Data Analysis

Mean was used to answer the research questions. The hypothesis was tested with t-test and analysis of co-variance (ANCOVA). The pre-test scores of the achievement test was fused to the post test scores. The ANCOVA served as a means of controlling the extraneous variables from dependent variables thereby dealing with the threats of initial differences across the groups and increasing the precision of the experimental results. The statistical package for the social sciences (SPSS) computer analysis software was used for all data analysis in this study.

Results Presentation

Research Question:

What are the effects of collaborative learning, individualized instructional techniques and conventional teaching method on higher institution students academic achievement in measurement and evaluation.

The results associated with this research question are presented in the table below:

Table 1

Mean of students' pre-test and post achievement test scores in measurement and evaluation.

Groups	Sample Size	Pre-test Mean	Post-test mean	Grouped Mean
Collaborative learning (Experimental 1)	79	18.06	73.19	55.13
Individualized Instructional techniques (Experimental 2)	60	18.26	72.27	54.01
Conventional Instructional Method (Control Group)	53	19.39	53.94	34.55

Table 1 above shows that the pre-test mean score were 18.06 (collaborative learning), 18.26 (individualized instructional techniques) and 19.39 (conventional instructional method) for treatment and control groups respectively. The pre-test mean scores of the students showed that the control group performed better (19.39) than the two experimental groups, while the difference in pre-test mean performance score was low the post-test mean score showed that students taught with collaborative learning method had higher post treatment. Mean score of 73.19, which was followed by students that used individualized with instructional techniques 72.27 and students that were taught with conventional method who had a mean performance score of 53.94. The grand mean of the experimental groups of 55.13 (collaborative learning) 54.01 (individualized instructional techniques) was also far higher than that of the control group (34.55). The implication is that, collaborative learning and individualized instructional techniques had positive effects on higher institution

students mean performance scores in measurement and evaluation. The difference between the post-treatment mean score of collaborative learning individualized instructional techniques was high compared with the difference between the pre-test mean scores.

Hypothesis

There is no significant difference in the performance of 200 level of higher institutions students academic achievement in measurement and evaluation taught with collaborative learning, individualized instructional techniques and conventional instructional method at post-test.

The results associated with the hypothesis are presented below:

Table 2

Source of Variation	Sum of square	Df	Mean Square	Critical F	Significance	F-value
Correlated Model	13852.841	3	4617.614	272.165	.001	2.08
Intercept	13508.729	1	13508.729	96.212	.001	2.71
Pre-test (covariance)	193.061	1	193.061	11.379	.001	2.71
Method (Main)	13740.952	2	6870.476	404.950	.001	2.30
Error (Residual)	3189.654	188	16.966			
Total	894139.000	192				
Correlated Total	17042.495	191				

$P < .05$

Table 2 shows the general result of performance scores using ANCOVA with only two aspects being very relevant to the objectives of this study. These aspects are the pre-test and post test method. The first aspect necessary for testing null hypothesis showed F-value of method to be 404.95 being significant at an alpha level of .001, the critical F-value is 2.30. The calculated F-values (404.95) is greater than the critical value of 2.30, therefore, the null hypothesis is rejected. Table 2 shows that the performance scores of measurement and evaluation students taught with collaborative learning and individualized instructional techniques were significantly different and higher than those of the students taught with the conventional instructional method, in favour of the experimental treatment groups of students. Therefore, the null hypothesis which

states that there is no significant difference in the performance of higher institution students taught with collaborative learning, individualized instructional techniques and conventional instructional method is rejected. Consequently, there is significant difference in the achievement of higher institution students taught with collaborative learning, individualized instructional techniques and conventional instructional method.

Table 3

Multiple comparisons post-Hoc test using Bon ferroni techniques with dependent variables of performance in measurement and evaluation.

Methods		Mean	Standard	Significance
Group (i)	**Group (j)**	Difference (i - j)	Error	
CL	CIM	19.751	.746	.001
IIT	CIM	18.751	.746	.001
CIM	CL	1.000	.706	.474

The mean difference is significant at .05 level.

Table 3 shows a pair wise comparison of collaborative learning and conventional instructional method with a mean difference of 19.751 in favour of collaborative learning. This means that collaborative learning method was superior to conventional instructional method. This implies that students taught measurement and evaluation with collaborative learning performed better than those students taught with individualized instructional technique. Also, an individualized instructional technique was superior to conventional instructional method with a mean difference of 19.751.

Therefore, higher institution students taught with individualized instructional techniques performed higher than those students taught with conventional instructional method, but the paired comparison of individualized instructional techniques and collaborative learning showed a mean difference of 1.000, which indicates no difference between individualized instructional techniques and collaborative learning, hence there was no superiority of one or the other.

Summary of the Findings

Based on the data collected and analyzed for this study, the following findings were made:

1. The experimental and control groups had their pre-test X scores ranging from 18.06 to 19.39, collaborative learning, X = 18.06, individualized instructional techniques; and conventional instructional method, X = 19.36, thus, there was no difference in the pre-test, X scores of higher institution students in the three groups.

2. The post-test X scores showed that treatment have the collaborative learning and individualized instructional techniques had effect on students performance in measurement and evaluation in favour of collaborative learning and individualized instructional techniques. The performance of students taught with collaborative learning and individualized instructional techniques was superior to the performance of students taught with conventional method with (73.19, 72.19 and 53.94) thus, collaborative learning method and individualized instructional techniques had positive effects on students' mean performance scores in measurement and evaluation at post-test.

3. Teaching methods had significant effect (P = .05) on students' performance in measurement and evaluation (F= 404.950), students in collaborative learning and individualized groups performed better than those in the conventional instructional method. The calculated f-value (404.95) was greater than the critical value of 2.30 therefore, the null hypothesis was rejected.

Discussion of the Findings

The study revealed that there was difference in the performance of higher institution students due to instructional methods. The students taught with collaborative learning and individualized instructional techniques achieved more than those taught with the conventional teaching method. The study revealed that students taught under the first experimental group (collaborative learning) achieved more than those taught under individualized and conventional instructional method (73.19 versus 72.27 versus 53.94) respectively. From the findings of this study, there was a difference in the performance mean score of higher institution students taught with collaborative learning and individualized instructional techniques and those taught with conventional instructional method. The collaborative group performance mean score was superior to those under the control group (conventional instructional

method). However, there is no difference between the performance of students in collaborative learning and individualized instructional technique. The findings of the study revealed that experimental groups obtained higher mean performance scores as a result of the methods they were exposed to than the control group of higher institution students taught with conventional instructional method.

This finding is in line with that of similar experimental students by Umameiye and Aduwa, Ogiegbena (2006) Ukadike (2005), Adeola (2004) respectively, where the experimental treatment were more effective than the conventional instructional method. The study is also in line with the findings of Adediran (2018) who reported that co-operative learning and instructional techniques are more effective than conventional instructional method.

Recommendations

Based on the findings of this study, the following recommendations were made:

i. Measurement and Evaluation lecturers should be encouraged to employ collaborative and individualized instructional techniques in order to increase the level of higher institution students' performance in measurement and evaluation.

ii. The school administrators should ensure that measurement and evaluation lecturers used collaborative learning and individualized instruction techniques. Lecturers that are engaged in in-service training, seminars, workshops conferences and other forms of training–on-the-job should employ collaborative learning and individualized instructional techniques. This is because the two pedagogical strategies were found to be superior to conventional instructional method which is commonly and currently in use in the higher institutions.

iii. Institution of higher learning charged with the responsibilities of training and producing teachers should train their students in the use of collaborative learning and individualized instructional techniques as methods of teaching in their institutions.

iv. The conventional instructional method which seems to prevail in Nigeria educational institutions should be minimized especially in measurement and evaluation teaching. Every teacher at any level of

education should have the necessary teaching skills. This could be acquired in the education faculties of universities and other tertiary institutions where different techniques and methods of teaching are learnt.

Conclusion

From this Study, it can be concluded that higher institutions students could perform very high in measurement and evaluation, if they are exposed to effective and quality instruction. It is very clear that the conventional instructional method of one lecturers per one course has been characterized with problems which limit the mastery level of many Nigerian tertiary institution students. It is necessary for measurement and evaluation lecturers to make use of two or more instructional strategies for improving teaching and learning of the course.

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