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Future of the Lebanese Middle School Science Teaching Methods: The Importance of Teacher's Shifting from Passive Learning to More Active Learning in Science Classes

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Abstract

This study evaluated the importance of integrating active learning techniques in to Lebanese middle school science classes. It examined the effect of this modification on students' academic performance and social development .The researcher collected data by using mixed method approach referred to as sequential explanatory design where the research collected both quantitative and qualitative data. The quantitative data was collected by distributing questionnaire developed based on 5 point Likert- scale to a non-probability convenience sample (N=50) of science teachers and the qualitative data was collected by performing an online interview with four middle school science teachers. The researcher used Statistical Package for the social sciences program (SPSS) to analyze quantitative data and to answer the studied hypothesis and problematic by using three tests (a) one sample T-test, (b) one way Manova test, and (c) correlation test. The interview data was analyzed qualitatively .The findings of this study showed that (a) there is a significant importance for teachers' shifting from passive learning to more active learning in Lebanese middle school science classes, (b) Lebanese middle school science teachers are modifying their teaching methods in their classes to improve students' academic performance and social development, and (c) there is a significant effect of the teaching methods modification on students' academic performance and social development based on the Lebanese middle school teachers' perspective.

Keywords: active learning techniques, Lebanese middle school science classes, academic performance, social development, teachers' perspectives

1. Introduction

The Lebanese educational system is too grades-centric and stresses passing the exam, neglecting the fact that education should be teaching how to succeed in life. To address this, the Lebanese educational system must be modified to fit the society of tomorrow, including training students to learn communication skills, motor skills, and self-presentation skills. Generation Z students need to be trained to succeed in life, not just to pass tests, by shifting the learning styles used in the Lebanese middle school from passive learning to active learning techniques. Simon Sinek believes that education can play a bigger role in preparing young people for their future. This study is concerned with modifying the teaching techniques used in science classes as the first step towards the educational change. This study aims to modify teachers' learning techniques in Lebanese middle school science classes to integrate more active learning methods. This will involve creating new classroom setups such as desks facing each other, round tables, technology and choices, outdoors sessions, filed trip teaching, and project based learning. This will help students learn new skills and develop social and academic success (Cilliers E. J., 2017).

The purpose of this study is to examine to what extent Lebanese middle school science teachers' are integrating active learning techniques in to their classrooms and how this teaching practices modification is affecting on both students' academic performance and social development.

In this research work, the researcher is aiming to study and answer the following questions:

1. To what extent are Lebanese middle school science teachers modifying their teaching methods in their classes to improve students' academic performance and social development?

2. What are Lebanese middle school science teachers' modifications of their teaching methods in their classes to improve students' academic performance and social development?
3. What are Lebanese middle school science teachers' perceptions of the effect of teaching methods modifications on students' academic performance and social development?

Research Hypotheses

H1: There is a significant importance for teachers' shifting from passive learning to more active learning in Lebanese middle school science classes.

H2: Lebanese middle school science teachers are significantly modifying their teaching methods in their classes to improve students' academic performance and social development.

H3: There is a significant effect of the teaching methods modification on students' academic performance and social development based on the Lebanese middle school science teachers' perspective.

2. Literature Review

The main theories to be taken in to consideration in this study are: (1) theories for the curriculum development, (2) theories for student's academic performance, and (3) theories for students' social development.

Concerning the theories related to the curriculum development the research will support the constructivism and the pragmatism theories.

Constructivism Theory

Constructivism theory was greatly supported by Piaget. Constructivism is based on the idea that the individual construct his or her own knowledge based on experiences faced. Whether this experience is positive or negative will leave a print in the person and lead to psychological and cognitive development. Piaget greatly supported this point when he mentioned in his theory schema, assimilation and accommodation. These process that prove how an individual starting from early childhood till teenager year (12 years old) keep constructing knowledge based on experiences faced before or recently modified due to new factors. The concept constructivism drives psychologists to integrate the concept of student-centered approach where teachers' are considered facilitators rather that direct monitors. The student in such approach is considered to be an asking student rather than a listener student. That is exactly what this study is going to address especially when integrating experimental work in to the middle school Lebanese science curriculum (Brau, 2020).

Pragmatism Theory

Pragmatism this theory that John Dewey supported maintains that knowledge can be gained by activities and real life experience knowing that pragmatism means to work. This American theory like constructivism believes that learner conduct knowledge alone. Pragmatism aim to develop students based on three concepts: (1) physical development, (2) cognitive development, and (3) social development. In other words encourage moving toward holistic education. In a positive motivational environment the child will be trained to deal with real life experiences and try to find solutions. Such way of education increases the students' problem –solving ability. In addition to focusing on developing activities that students are interested about and integrate it in the school curriculum. In that way the student will graduate as a well experienced and creative citizen in his or her country. Based on John Dewey view toward pragmatism and education the school curriculum should focus on teaching practical subjects such as reading, writing, mathematics, art, craft work and many other forms of such subjects . In this way the student is trained on the inductive method of teaching that is greatly relied on in science subjects especially in analysis when moving from specific factors to a general conclusion (Sakshi sharma, 2018).

Walberg's Theory

Concerning theories related to the students' academic performance the researcher will focus on the educational productivity. It is a theory done by Herbert J.Walberg trying to study what factors can influence and affect the academic performance of students. In this theory Walberg tried to study many variables that affect the students' academic performance. These variable where represented as a nine productivity factors that can be divided in to three different sets. First set that is subtitled as students' attributes that include students' ability, students' development and students' motivation .Second set that is subtitled as instructions that focuses mainly on both the quality and quantity of teaching . Third set that is subtitled as psychological environment that includes classroom climate, home environment, peer groups and access to mass media (Chemosit, 2005).

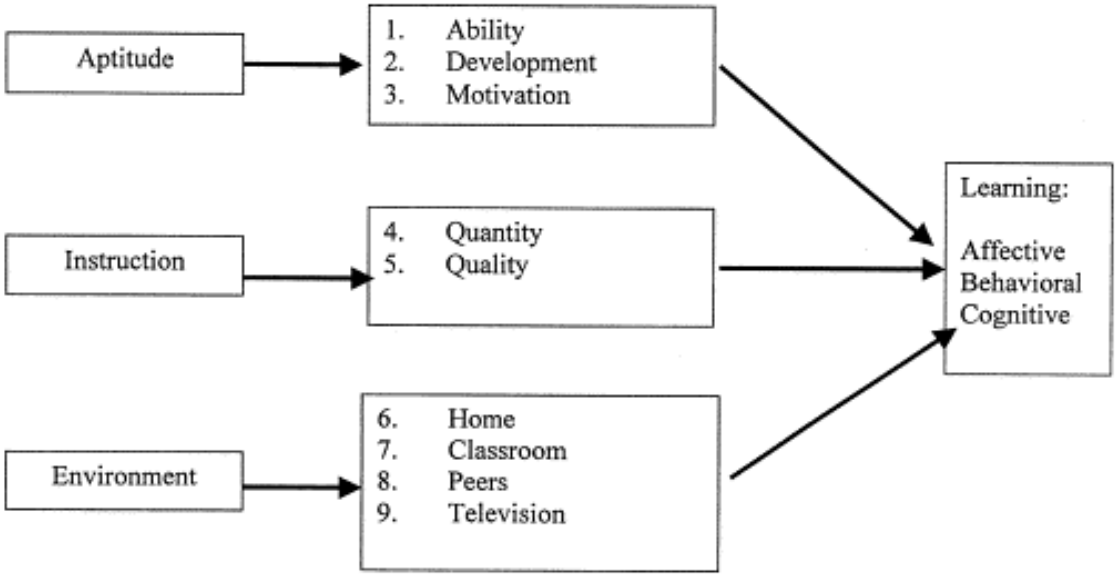

Figure 1. Walberg's (1981) General Educational Prductivity Model On The Learning Influence

Lev Vygotsky Theory

Lev Vygotsky theory. Lev Vygotsky was best known for his socio-cultural theory related to students' social development. This theory proved that social interactions triggers student learning by contacting with more knowledgeable individuals like teachers, peers, and elder siblings will increase the students' zone of proximal development(ZPD). The ZPD contain three zones : zone one that can be referred to as what the student know, zone two that focus on what the student don't know well and need a support in other words scaffolding, and zone three what student is able to achieve alone without an external help. By engaging students with more knowledgeable individuals the student has the chance to debate, argue, and discuss information freely an issue that not only increase the student cognitive abilities but also address the self-esteem and communication skills. An issue that emphasizes that the educational process is not only about transmitting knowledge but also about sharing thoughts and developing a successful individual to succeed in life as well. Group work and discussions if integrated to middle school science classes' students' curiosity will be boosted and more logic scientific analysis will be developed . Lecturing alone is an old traditional way that grievance the beauty of science subjects (C.Howe, 1996).

Design of the study

This study is conducted in a mixed method approach referred to as sequential explanatory design. The quantitative data is collected by asking participants to answer a questionnaire to study the correlation between variables addressed. The variables are teachers' beliefs towards modifying their teaching methods and their influence on students' academic performance and social development. A random sample of Lebanese middle school science teachers was used to collect the quantitative data. The qualitative data collection was done through an online interview due to the Covid-19 pandemic. Analysis of both quantitative and qualitative results took place to answer the research questions and problem addressed in this study.

Participants

This study aimed to collect 50 Lebanese science teachers or any other nationality teachers who are teaching the Lebanese science curriculum in both urban and rural countries. Non-probability convenient sampling was addressed, with the target number of participants reaching 50 science teachers. Four Lebanese middle school science teachers were selected to participate in an online interview that didn't last more than 15-20 minutes. A series of ten questions was asked during the academic year 2021-2022. All participants were more than 20 years old with at least 2-5 years of experience in middle school Lebanese science curriculum in both private and public sector organizations and all were holding either teaching diploma or masters'.

Procedure

The study was conducted by referring back to the university institution review board (IRB) or the Ethical Review Board (ERB). Confidential privacy of the participants was respected, full disclosure and transparency was used in both the questionnaire and the interview participation. Codes were used to refer to each participant during the interviews. The

collection of data was done after receiving the acceptance from the IRB committee at LIU. Sequential Explanatory method was used in collecting both quantitative and qualitative data.

The questionnaire contained demographic information about the participants, questions about the importance of teachers shifting in middle school science classes, modifying their teaching techniques in the Lebanese middle school science classes, and the effect of modifying the teaching techniques in the Lebanese middle school science classes. The online interview contained questions concerning teachers' beliefs and perspectives toward the importance of modifying the teaching methods used in the middle school science classrooms and how this modification will affect the students' academic performance and social development.

Instruments

For this study, the researcher collected both quantitative and qualitative data. Quantitative data was collected through a questionnaire consisting of 30 items, while qualitative data was collected through four online and individual interviews with four Lebanese middle school science teachers. The researcher used the Likert scale, SPSS, Cronbach's Alpha, and Guttman split-half Coefficient to analyze the results of the questionnaire. To test the hypothesis, the researcher calculated the mean, standard deviation, and mode for each item of the questionnaire. The researcher also applied the one-sample T-Test to determine the relevance of the responses to the value (3) which reflects neutrality.

H0: $\mu variables = 3$

H1: $\mu variables \neq 3$

(μ: is the mean of the sample)

Using the **correlation test** the researcher analyzed the relation between quantitative variables if it is: negligible relation, lower relation, moderate relation, higher relation or very high relation. Sign varies from -1 till +1 (positive or negative relation).

Ho: $r=0$

H1: $r \neq 0$

(r: according to the questionnaire variables)

The researcher also applied **one way MANOVA** to study the significant group difference between one independent variable qualitative (three or more categories) with two dependent variable quantitative. Knowing that the significant will be studied according to the P-value that is 0.05.

H0: $\mu 1=\mu 2=\mu 3$

H1: $\mu 1 \neq \mu 2 \neq \mu 3$

($\mu 1, \mu 2, \mu 3$: according to the questionnaire variables)

The researcher developed a questionnaire and interview questions to compare and contrast both data obtained. A piloting step was done to distribute the questionnaire to a mini sample of 10 middle school science teachers. The feedback received from the participants helped the researcher edit and change some questions to make all questions clear and on point. The interview was done with a mini sample of four middle school science teachers and two were interviewed online. One week later, the same two teachers were re-interviewed again. The feedback received was taken into consideration and questions were edited.

Data Analysis

In this study the researcher analyzed quantitative data using SPSS, descriptive, and inferential statistical analysis. The descriptive analysis was based on means, mode and standard deviation, while the inferential analysis was based on Pearson r coefficient. Qualitative data was also analyzed to compare and contrast the quantitative results obtained with the qualitative data analyzed.

The questionnaire was used to analyze teachers' beliefs and perspectives on modifying Lebanese middle school teaching practices. Quantitative data was analyzed statistically and results were interpreted using tests such as one sample T-test, one way MANOVA, and correlation tests. Qualitative data was used to compare and contrast quantitative results with qualitative data. Results were clearly addressed and strongly analyzed.

Results

The population of the study consists of Lebanese science teachers teaching the Lebanese science curriculum, randomly chosen from LIU student teachers and outside the LIU committee. 50 questionnaires were distributed and 50 were valid for testing and analysis.

Table 1. The sample distribution according to demographic data

Variable	Category	Frequency	Percent
1)Education level:	Bachelor	9	18.0
	Teaching diploma	5	10.0
	Master	29	58.o
	PHD	7	14.0
2)Major:	School of education	13	26.0
	School of science	19	38.0
	School of engineer	6	12.0
	School of business	12	24.0
3)Job Position:	Middle School Teacher	18	36.0
	High school Teacher	20	40.0
	Coordinator	3	6.0
	Curriculum developer	3	6.0
	Lecturer	6	12.0
4)subject taught:	Science	12	24.0
	Biology	11	22.0
	Chemistry	3	6.0
	Math	11	22.0
	Physics	6	12.0
	Other	7	14.0
5)Years of experience:	0-5 years	19	38.0
	5-10 years	25	50.0
	more than 15 years	6	12.0
6) Type of school:	Privet school	36	72.0
	Public school	11	22.0
	International school	6	6.0
7) School Size:	Large school size	17	34.0
	Medium school size	32	64.0
	Small school size	1	2.0
8) Capacity of every classroom	15-20 student	20	40.0
	20-30 student	14	28.0
	30 and above	16	32.0
9) Curriculum follow	National Lebanese curriculum	38	76.0
	International curriculum	12	24.0
10) Second language taught in classroom	English	31	62.0
	French	19	38.0

Based on the information proved in table 1:

According to the education level 18% of the samples have a Bachelor's degree, 10% have a teaching diploma, 58% have a Master's degree, and 14 % have a PHD. According to the job position, 36% of the samples are middle school teacher, 40% are high school teacher, 6% are coordinators, 6% are Curriculum developer, and 12% are lecturers. According to the subject taught, 24% of the sample teach science, 22% of the sample teach biology, 6% of the sample teach chemistry, 22% of the sample teach math, 12% of the sample teach physics, and 14% of the sample teach other subjects. According to the type of school, 72% of the sample are privet schools, 22% of the sample are public schools, and 6% of the sample are international schools. According to the capacity of every classroom, 40% of the sample have 15-20 students, 28% of the sample have 20-30 students, and 32% of the sample have 30 student and above. According to the curriculum followed, 76% of the sample follow national Lebanese curriculum and 24% of the sample follow international

The study tool used is the five-point Likert scale were the following table shows the scale range:

Table 2. The Scale ranges of the five-point Likert scale (Mean)

No.	Response	Range	
		From	To
1	Strongly agree	1.00	1.80
2	Agree	1.81	2.60
3	Neutral	2.61	3.40
4	Disagree	3.41	4.20
5	Strongly Disagree	4.21	5

Reliability

To study reliability Table 3 shows the following

Table 3. Cronbach's Alpha and Guttmann split-half Coefficient

No. of Items	Cronbach's Alpha	Split-Half	
		Correlation Between Forms	Guttmann Split-Half Coefficient
20	0.856	0.729	0.819

According to Table 3, the value of Cronbach's Alpha is equal to 0.856 and the value of the Guttmann Split-Half Coefficient is equal to 0.819. This means that there is reliability in the 20 items of the questionnaire.

Descriptive Statistics

The researchers first null hypothesis is: " The importance of teachers shifting from passive learning to more active learning in the Lebanese middle school science classes". To test this hypothesis, the researcher calculated the mean and standard deviation for each item of the questionnaire. In addition to using the One-Sample T-Test in order to determine the relevance of the responses to the value (3) which reflects neutrality :

Ho: **μvariables =3**

H1: μvariables ≠ 3

(μ = Is the mean of the sample)

The results are shown in the following tables

Table 4. Statistical analysis of the second section in the questionnaire

	N	Mean	Std. Deviation	Sig
1. Shifting from passive learning techniques to active learning techniques	50	1.8000	1.01015	.000
2. Active learning techniques is more effective than passive learning techniques in science classes	50	1.5800	.90554	.000
3. There is an observable shift from the passive learning approach to the active learning approach in the Lebanese middle school science classes	50	2.4000	.96890	.000
4. Middle school science teachers integrating active learning techniques to the Lebanese middle school science classes	50	2.5200	.97395	.001
5. Students will accept the shift toward integrating active learning techniques in to the Lebanese middle school science classes	50	1.8800	1.06215	.000

Based on the information provided in table 4:

Teachers are shifting from passive learning techniques to active ones in middle Lebanese school science classes, and that the mean is 1.5800 less than the neutral level. The value of the calculated one sample T-Test is 0.000 less than the significance (p-value) 0.05 that there is a significant difference rejects ho (3). On average, the spreading around the mean is between 0.78985 and 2.81015. This suggests that active learning techniques are more effective than passive

learning techniques in the middle school science classes. If there is an observable shift from the passive learning approach to the active learning approach, the mean is 2.400 less than the neutral level .

Table 5. Statistical analysis of the third section in the questionnaire

	N	Mean	Std. Deviation	Sig
1. Teaching methods used in the classrooms nowadays affect the students' academic performance and social development	50	1.8000	1.01015	.000
2. Middle school science teachers modify their teaching methods in their classrooms this will improve students' academic performance and social development	50	1.7400	.98582	.000
3. Lebanese middle school science teachers working on modifying the teaching methods in their classrooms	50	2.5400	.73429	.000
4. High level of students' academic performance and social development recorded in the Lebanese middle school science classes	50	2.5800	.81039	.001
5. Schools managers / leaders are helping teachers in modifying their teaching methods in science classrooms	50	2.9000	.97416	.471
6. Technological era we are living in and the new students needs should encourage teachers to start modifying their teaching techniques in the Lebanese middle school science classes	50	1.9000	1.05463	.000

Based on the information provided in table 5 :

Middle school science teachers are modifying their teaching methods to improve students' academic performance and social development. The mean value of the Lebanese middle school science classes is 1.7400 less than the neutral level, and the spread around the mean is between 0.75418 and 2.72582. Schools managers/leaders are helping teachers in modifying their teaching methods, but the mean value is 2.900 and the spread around the mean is between 1.92584 and 3.87416. Teachers should start modifying their teaching techniques in response to the new students' needs.

Table 6. Statistical analysis of the Fourth section in the questionnaire

	N	Mean	Std. Deviation	Sig
1. Teaching communication and teamwork skills in to the Lebanese middle school science classes affect students' academic performance and social development	50	1.6800	1.13281	.000
2. Integrating technological teaching techniques like smart boards and pads in to the Lebanese middle school science classes affect students' academic performance and social development	50	1.6800	.89077	.000
3. Integrating visual education techniques like scientific videos, pictures, simulation and virtual labs affect students' academic performance and social development	50	1.5800	.94954	.000
4. Integrating practical lab work and experimental analysis in to the Lebanese middle school science classes affect students' academic performance and social development	50	1.6000	1.10657	.000
5. Developing communication skills, teamwork skills and self-presentation skills can affect students' life and career choice after graduation	50	1.6400	1.10213	.000
6. Developing only cognitive skills and getting high grades is the only indicator for academic success	50	3.0200	1.50496	.926
7. Integrating active learning techniques in to the Lebanese middle school science classes can help developing students as a whole successful individuals ready for life after graduation	50	1.8000	1.10657	.000
8. The technological era we are living in and the new generation needs should drive curriculum developers to shift toward more active learning	50	1.7400	1.00631	.000
9. Updating teaching techniques based on new students' needs and the historical era we are living in will strengthen the education sector	50	1.7551	1.19949	.000

Teaching communication and teamwork skills in Lebanese middle school science classes affects students' academic performance and social development. Integrating technological teaching techniques, visual education techniques, practical lab work, and experimental analysis also affects students' academic performance and social development. Developing cognitive skills and getting high grades is the only indicator for academic success, and active learning techniques can help developing students as successful individuals ready for life after graduation. The average spreading around the mean is between 1.51504 and 4.52496. The value of the mean of the sample's responses to 18 variables of the questionnaire is less than neutral level, and the calculated one sample T-Test is 0.000 less than the significance (p-value) 0.05. Additionally, the average spreading around the mean is between 0.73369 and 2.74631. This suggests that teachers should shift from passive to active learning in the Lebanese middle school science classes.

Multivariate Analysis

To test the second null hypothesis " Lebanese middle school science teachers are modifying their teaching methods in their classes to improve students' academic performance and social development ". To test this hypothesis the researcher uses one-Way Manova were the results are presented in the following tables**.**

Variables

Independent variables: " Subject Taught "

Dependent variables:

1. Teaching methods used in the classrooms nowadays affect the students' academic performance and social development
2. Middle school science teachers modifying their teaching methods in their classrooms this will improve students' academic performance and social development.

H0: μScience = μBiology = μChemistry = μMath =μ physics = μOther.

H1: μScience ≠ μBiology ≠ μChemistry ≠ μMath ≠ μPhysics ≠ μOther.

Table 7. Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.754	65.857[b]	2.000	43.000	.000	.754
	Wilks' Lambda	.246	65.857[b]	2.000	43.000	.000	.754
	Hotelling's Trace	3.063	65.857[b]	2.000	43.000	.000	.754
	Roy's Largest Root	3.063	65.857[b]	2.000	43.000	.000	.754
St	Pillai's Trace	.452	2.569	10.000	88.000	.009	.226
	Wilks' Lambda	**.567**	**2.819[b]**	**10.000**	**86.000**	**.005**	**.247**
	Hotelling's Trace	.729	3.063	10.000	84.000	.002	.267
	Roy's Largest Root	.680	5.983[c]	5.000	44.000	.000	.405

According to information provided in table 8 the Wilkes Lamda p- value = 0.005 < 0. 05 which means that there is a statistically significant interaction effect.

Table 8. Descriptive Statistics

	subject taught	Mean	Std. Deviation	N
Teaching methods used in the classrooms nowadays affect the students' academic performance and social development	Science	2.5833	.79296	12
	Biology	2.4545	1.21356	11
	chemistry	3.0000	1.00000	3
	Math	2.1818	.87386	11
	physics	2.0000	1.26491	6
	Others	2.4286	.78680	7
	Total	**2.4000**	**.96890**	**50**
Middle school science teachers modify their teaching methods in their classrooms this will improve students' academic performance and social development	Science	1.6667	.77850	12
	Biology	1.4545	.68755	11
	chemistry	1.3333	.57735	3
	Math	1.8182	.75076	11
	physics	2.0000	1.67332	6
	Others	2.1429	1.46385	7
	Total	**1.7400**	**.98582**	**50**

Table 9. Test of between – subjects effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Teaching methods used in the classrooms nowadays affect the students' academic performance and social development	3.005[b]	5	.601	.615	.689	.065
	middle school science teachers modify their teaching methods in their classrooms this will improve students' academic performance and social development	3.066[b]	5	.613	.606	.696	.064
Intercept	Teaching methods used in the classrooms nowadays affect the students' academic performance and social development	236.310	1	236.310	241.236	.000	.846
	middle school science teachers modify their teaching methods in their classrooms this will improve students' academic performance and social development	119.475	1	119.475	117.989	.000	.728
St	**Teaching methods used in the classrooms nowadays affect the students' academic performance and social development**	**3.005 5**	**5**	**.601**	**.615**	**.689**	**.065**
	middle school science teachers modify their teaching methods in their classrooms this will improve students' academic performance and social development	**3.066 5**	**5**	**.613**	**.606**	**.696**	**.064**

Based on the information provided in table 7,8 &9:

The researcher's second hypothesis is that Lebanese middle school science teachers are significantly modifying their teaching methods in their classes to improve student academic performance and social development. The P-value of 0.689 > 0.05 accepts H0, meaning that each subject taught doesn't have a different point of view and all agree that teaching methods used in the classrooms nowadays affect the students' academic performance and social development. This confirms the researcher's second hypothesis that Lebanese middle school science teachers are significantly modifying their teaching methods to improve student academic performance and social development.

Correlation Test

The researchers third null hypothesize **"**The effect of teaching methods modification on students' academic performance and social development based on the Lebanese middle school science teachers' perspective". To test the hypothesis, the researchers apply correlation test to find the correlation between variables that is presented in the following tables:

Ho : r=0

H1 : r≠0

Table 10. Correlation Test Fourth section in the questionnaire

		technological era we are living in	integrating active learning techniques	developing only cognitive skills and getting high grades is the only indicator for academic success	developing communication skills, teamwork skills and self-presentation	integrating practical lab work and experimental analysis	integrating visual education techniques	integrating technological teaching techniques	teaching communication and teamwork skills
updating teaching based on new students' needs and the historical era we are living in will strengthen the education sector	Pearson Correlation	.783**	.754**	-.155	.806**	.873**	.832**	.775**	.806**
	Sig. (2-tailed)	.000	.000	287	.000	.000	.000	.000	.000

Based on the information provided in table 10:

Updating teaching techniques and integrating active learning to Lebanese middle school science classes is essential to strengthen the educational sector and graduate successful individuals. However, developing only cognitive skills and getting high grades is not the only indicator for academic success. Educators should help students develop other skills such as communication, self-presentation and teamwork to succeed in life after graduation. Updating teaching methods based on new students' needs and the historical era will strengthen the education sector and develop communication and teamwork skills in Lebanese middle school science classes. There is a strong positive correlation between these two variables. Moving in parallel with society changes and the historical era is essential for modifying the education sector to match each generation needs.

Teachers' interview

Analysis of results

To validate and strongly prove the results obtained from the quantitative data the researcher did a qualitative data collection by performing an online interview due to the Covid-19 pandemic we are still experiencing in Lebanon with four middle school science teachers . The first two participants (participants 1 and 2) are still using the old traditional passive way in their middle school science classes. While the other two participants (participants 3 and 4) are integrating new active teaching techniques to their middle school science classes all teaching in both public and private Lebanese schools dealing with the Lebanese national curriculum. The participants were either holding teaching diploma

in education or master degree in education since some questions needs participants to be aware of some educational theories.

Analyzing Interview Answers of Participant 1 and 2

The two middle school science teachers in Lebanon agreed that the old traditional passive teaching methods don't fit the new generation students' needs. They also agreed that science is an interesting topic and that integrating new active learning techniques will improve students' academic performance and social development. They also agreed that Lebanese schools are not supporting the shift towards active learning due to grades, overloaded curriculum, time needed to train teachers, and budget. They also agreed that students should be taught to be successful individuals in society and that integrating new active learning techniques like practical lab work, performing experiment in front of them, visual techniques like power point, videos will address the information in a better way and trigger curiosity and constructivism**.** Both teachers also agreed on the importance of taking into account the technological era and how it should affect the education sector. They also agreed that the school is not supporting the shift towards integrating active techniques due to grade concern, overloaded curriculum, and cost. They also agreed that teachers should focus on developing competences in students such as social skills to build a strong personality, boost understanding, and constructivism. This shows that teachers are becoming aware of the importance of developing competences in students that help them to face life obstacles.

Analyzing Interview Answers of Participant 3 and 4

Two middle school science teachers in Lebanon have agreed that active learning techniques are more successful than passive learning techniques in their classrooms. They agree that the teaching methods used in the classroom effects on the students' academic performance and social development, and that integrating active learning techniques is more effective than passive learning techniques. They also agree that the new generation students are looking for education as a link between their present and the future jobs waiting for them after graduation, and that integrating active learning techniques increases their motivation and facilitates the understanding of the lesson in a more smooth easy way. Both teachers in the seventh and tenth questions mentioned that their students accepted the shift to integrating active learning techniques and felt more motivated to attend the session. Active learning techniques developed new competences, presentation and communication skills, and upper level skills. They also advised schools, teachers, and curriculum developers to start integrating active learning techniques in Lebanese middle school science Active learning techniques have been shown to be effective in Lebanese middle school science classes, with positive results such as increased academic scores and development of social skills. Active learning techniques help teachers create a positive motivational classroom environment that attracts the attention of technological era students and boosts their curiosity.

Discussion of the questionnaire

By analyzing the questionnaire data the researcher concluded that teachers are shifting from passive learning techniques to active ones in the Lebanese middle school science classes. Participants agreed that active learning techniques are more effective than passive ones. Teachers are modifying their teaching methods to improve students' academic performance and social development, but managers and leaders are not supporting them. High levels of students' academic performance and social development are being recorded. The Technological era and the new students' needs should encourage middle school science teachers to modify their teaching techniques to meet the new generation students' needs. Integrating technological teaching techniques, visual education techniques, communication skills, teamwork skills, and self-presentation skills affect students' academic performance and social development. Active learning techniques should be integrated into the Lebanese middle school science classes to graduate successful individuals ready for life after graduation. This step will strengthen the education sector in Lebanon.

Discussion of the Online Interview

By analyzing the data collected from the online interviews with the all participants the researcher concluded that All participants agreed that active learning techniques should be integrated in Lebanese middle school science classes to improve academic performance and social development. They also agreed that scores are no longer the only indicator for academic success, and those new active learning skills like power point, videos, and practical lab work will help students face challenges and be ready for life after graduation. Participants agreed that the shift to more active learning techniques in Lebanese middle school science classes is important for positive effects on academic performance and social development. However, some schools still don't support the shift due to their focus on grades and passing exams. Teachers are working to modify their teaching methods and are moving towards more active learning techniques to fulfill the technological era students' needs.

3. Conclusion

The study found that Lebanese middle school science teachers are incorporating active learning techniques and teaching practices modification is affecting student academic performance and social development. Questionnaire and online interviews showed that teachers agreed on the importance of shifting to more active learning techniques, taking into account new technological students' needs, and supporting this shift. Teachers should refer to their experience and perception to study the case and move towards the change.

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Appendix A

Questionnaire Share with Middle School Science Teachers:

A) General Information

1. Education Level
    - Bachelor
    - Teaching Diploma
    - Masters
    - PHD
    - Others Specify
      ----
2. University Major
    - School Of Education
    - School Of Science
    - School Of Engineer
    - School Of Business
    - School Of Art
    - Others Specify
      ----
3. Job Position
    - Middle School Teacher
    - High School Teacher
    - Coordinator
    - Curriculum Developer
    - Lecturer
    - Others Specify
      ----
4. Subject Taught
    - Science
    - Biology
    - Chemistry
    - Math
    - Physics
    - Others specify
      ----
5. Years Of Experience
    - 2-5 years
    - 5-10 years
    - More than 15 years
6. Type Of School

- Private School
- Public School
- International School

7. School Size
   - Large sized school
   - Medium sized school
   - Small sized group
8. Capacity Of every classroom
   - 15-20 student
   - 20-30 student
   - 30 and above
9. Curriculum Followed
   - National Lebanese Curriculum
   - International Curriculum
10. Second Language taught in classroom
   - English
   - French

B) Importance Of Teachers Shifting In Middle School Science Classes :

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
11. Do you think that there is a significant important for the teachers' shifting from passive learning techniques (using traditional techniques like lecturing) to active learning techniques(integrating technology, classroom discussion and experimental work) in middle school science classes?	1	2	3	4	5
12. Do you think that active learning techniques in more effective than passive learning techniques in science classes?	1	2	3	4	5
13. Do you think that there is an observable shift from the passive learning approach to the active learning approach in the Lebanese middle school science classes ?	1	2	3	4	5
14. Are middle school science teachers integrating active learning techniques to the Lebanese middle school science classes ?	1	2	3	4	5
15. Do think that student will accept the shift toward integrating active learning techniques in to the Lebanese middle school science classes?	1	2	3	4	5

Teachers Modifying Their Teaching Techniques In The Lebanese Middle School Science Classes:

16. Do you think that teaching methods used in the classrooms nowadays affect the students' academic performance and social development ?	1	2	3	4	5
17. Do you think that if middle school science teachers modify their teaching methods in their classrooms this will improve students' academic performance and social development ?	1	2	3	4	5
18. Are the Lebanese middle school science teachers working on modifying the teaching methods in their classrooms?	1	2	3	4	5
19. Do think that there is a high level of students' academic performance and social development recorded in the Lebanese middle school science classes?	1	2	3	4	5
20. Do you think that schools managers leaders are helping teachers in modifying their teaching methods in science classrooms ?	1	2	3	4	5
21. Do you think that the technological era we are living in and the new students needs should encourage teachers to start modifying their teaching techniques in the Lebanese middle school science classes?	1	2	3	4	5

C) Effection Of Modifying The Teaching Methods In The Lebanese Middle School Science Classes :

22. Do you think teaching communication and teamwork skills in to the Lebanese middle school science classes affect students' academic performance and social development ?	1	2	3	4	5
23. Do you think that integrating technological teaching techniques like smart boards and pads in to the Lebanese middle school science classes affect students' academic performance and social development ?	1	2	3	4	5
24. Do you think that integrating visual education techniques like scientific videos, pictures, simulation and virtual labs affect students' academic performance and social development ?	1	2	3	4	5
25. Do you think that integrating practical lab work and experimental analysis in to the Lebanese middle school science classes affect students' academic performance and social development ?	1	2	3	4	5
26. Do you think that developing communication skills, teamwork skills and self-presentation skills can affect students' life and career choice after graduation ?	1	2	3	4	5
27. Do you think that developing only cognitive skills and getting high grades is the only indicator for academic success ?	1	2	3	4	5

28. Do you think that integrating active learning techniques in to the Lebanese middle school science classes can help developing students as a whole successful individual ready for life after graduation ?	1	2	3	4	5
29.Do you think that the technological era we are living in and the new generation needs should drive curriculum developers to shift toward more active learning curriculum ?	1	2	3	4	5
30. Do you think that updating teaching techniques based on new students' needs and the historical era we are living in will strengthen the education sector ?	1	2	3	4	5

Appendix B

Online Interview Done With Four Middle School Science Teachers

Participant (1 and 2) : With two teachers still using the old traditional passive ways of teaching in his/her science classroom middle school level

1. Do you think that the traditional passive ways of teaching still satisfy the new generation student's needs?
2. Do you think that as a science subject the traditional passive ways of teaching fulfill all the subject objectives?
3. As a science subject there is a lot of analysis, interpretation and debates to discuss do you think that integrating new active learning techniques will help improve both students' academic and social development skills?
4. In the Lebanese schools the main concern is grades and to pass the official exams do you think that this is one of the reasons to keep using passive ways in education?
5. Does your school support integrating active learning techniques like videos, simulation, virtual labs and team work project to your science classroom ?
6. Students should be taught to be a successful individual in society as a whole not only in academic achievements do you support this point of view?
7. What new techniques would you like to integrate to your science classroom ? And do you thing this integration can affect academic performance and social development of students ?
8. Do you think that the technological era we are living in affects the education sector and should cause a change or shift in the way of education ?
9. Do you think that schools will support the idea of start shifting to active learning techniques especially in science classes ?
10. What competences do you aim to develop in your students at the end of the year other than high academic scores ?

Participant (3 and 4): With two teachers integrating new active teaching techniques in to his/her science classroom middle school level

1. As a teacher experiencing both the passive learning techniques and active learning techniques which approach seems more successful ?
2. The teaching methods used strongly affect students' academic development and social skills . Based on your own experience how this can be explained ? (example variation in scores recorded, level of motivation and engagement in lesson flow, students communication skills, students presentation skills, students negotiation skills, etc…)
3. Do you agree on a point that active learning is more effective especially in science classes ?
4. As a middle school teacher dealing with new generation students on a daily basis, do you think that the academic score are still the students' main target?

5. As a middle school science teacher using active learning techniques how this affected on the whole classroom environment?
6. When and why did your school decided to shift toward using active learning techniques in middle school science classes ?
7. Did your students accept this shift easily or their where some obstacles at first?
8. What new competences active learning techniques train students on?
9. Having communication, negotiation and presentation skills are essential to life after graduation, how can active learning techniques help develop these skills.
10. Do you advice schools, teachers and curriculum developers to start shifting toward active learning techniques?