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The Effect of the Andalus Knowledge Phases and Times Model of Learning on the Development of Students' Academic Performance and Emotional Quotient

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Abstract—This study aimed at investigating the effect of Andalus Knowledge Phases and Times (ANPT) model of learning and the effect of 'Intel Education Contribution in ANPT' on the development of students' academic performance and emotional quotient. The society of the study composed of Andalus Private Schools, elementary school students (N=700), while the sample of the study composed of four randomly assigned groups (N=80) with one experimental group and one control group to study "ANPT" effect and the "Intel Contribution in ANPT" effect respectively. The study followed the quantitative and qualitative approaches in collecting and analyzing data to answer the study questions. Results of the study revealed that there were significant statistical differences between students' academic performances and emotional quotients for the favor of the experimental groups. The study recommended applying this model on different educational variables and on other age groups to generate more data leading to more educational results for the favor of students' learning outcomes.

Keywords—ANPT, Flipped Classroom, 5Es learning Model, Kagan structures.

I. Introduction

ANPT is the model of learning suggested by Al-Andalus Private Schools, Educational Development Administration, Studies & Research Department, KSA. [1] A is the abbreviation for Andalus, N is the abbreviation for Knowledge, P is an abbreviation for learning phases and T is the abbreviation for learning times. ANPT means to germinate in Arabic (i.e. to put seeds in a suitable soil and maintaining optimal conditions for the seeds to develop into siblings then continue growing into mature fruited plants) [2] ANPT is the fruition of the cooperativity among four of the best practices in education: [3]–[6]

A. The skeleton is the 5Es Model learning cycle.

B. The steps of the 5Es are implemented using Kagan structures.

C. The class management is performed through the Intel Education hardware and software.

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D. The flipped classroom, the part that requires the student to use media (i.e., videos, journals, pictures, etc. …) at home, is done under the support of **Classera** New E-Learning Era.

In addition, the whole learning process is guided by the "constructivism learning theory" and "Vygotsky Cognitive Development Theory".

II. The Purpose of the Study

This study was undertaken to test both the effect of the ANPT Model and the effect of the "Intel Education Contribution in ANPT" on the development of the students' academic Performance and Emotional Quotient (EQ).

III. How ANPT Works/Methodology

To explain how this model, ANPT, works let us divide the model into steps:

Step 1: The part of the flipped learning where the teacher, for example, makes a discussion board on Classera to send a piece of video of duration 1-1.5 min/grade (i.e., for students in grade 4 the teacher should not introduce a video greater than 1.5 x 4 = 6 minute video) which helps students to know and understand the topic.

Step 2: When students are back to classroom, the teacher begins the class with an activity that helps him performing the first phase of the 5Es' Model, Engage Phase; this activity is either of the two Kagan Structures "Relay Review" or "Stir the Class" followed by another structure called "Think – Write – Round Robin". the two chosen structures aim at assessing student's pre-knowledge, encouraging student's free writing, and eventually creating **"intrinsic motivation"** [7] and **"interest"** [8].

Step 3: The teacher facilitates an activity that maintains the second phase of the 5Es' Model, Explore Phase, by using the first part of the "Numbered Heads Together" Kagan structure which supports the individual learning by collecting data using the Intel Tablet to record the data that can be monitored by the teacher through the Intel software "Classroom Management". This step aims at **"Growing independence".**

Step 4: The teacher facilitates an activity that maintains the third phase of the 5Es Model, Explain Phase, through

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the second part of the "Numbered Heads Together" Kagan structure which supports the team building and cooperation by discussion, peer tutoring and unifying the explanation that uses the data collected from the previous step but recorded in only one tablet of the four tablets in each team which is monitored by the teacher using Intel Education software (i.e., Classroom Management) that enables him to present the team response on the smart board and to get reflections from the other teams (i.e. collaboration). Teacher interference should be at the end of this step to correct the misconceptions and to introduce new concepts. This step aims at **"knowledge acquisition"** [9].

Step 5: The teacher facilitates an activity that maintains the fourth phase of the 5Es Model, Elaborate Phase, through the "Team – Pair – Solo" Kagan structure, which supports the cooperation and the content mastery through applying the information acquired from the previous phases in new situations. This step aims at **"Automation of Response"** [9].

Step 6: The teacher facilitates an activity that maintains the fifth phase of the 5Es Model, Evaluate Phase, through an "Exit Ticket", which could reflect a creation or innovation that crowns the learning cycle with six diamonds, the targeted skills (i.e., thinking, learning, social, kinesthetic, technical and leadership skills) that meet the 21st century 16 skills. This step aims to **"adaptation"** [10] that will inspire the student to seek new knowledge.
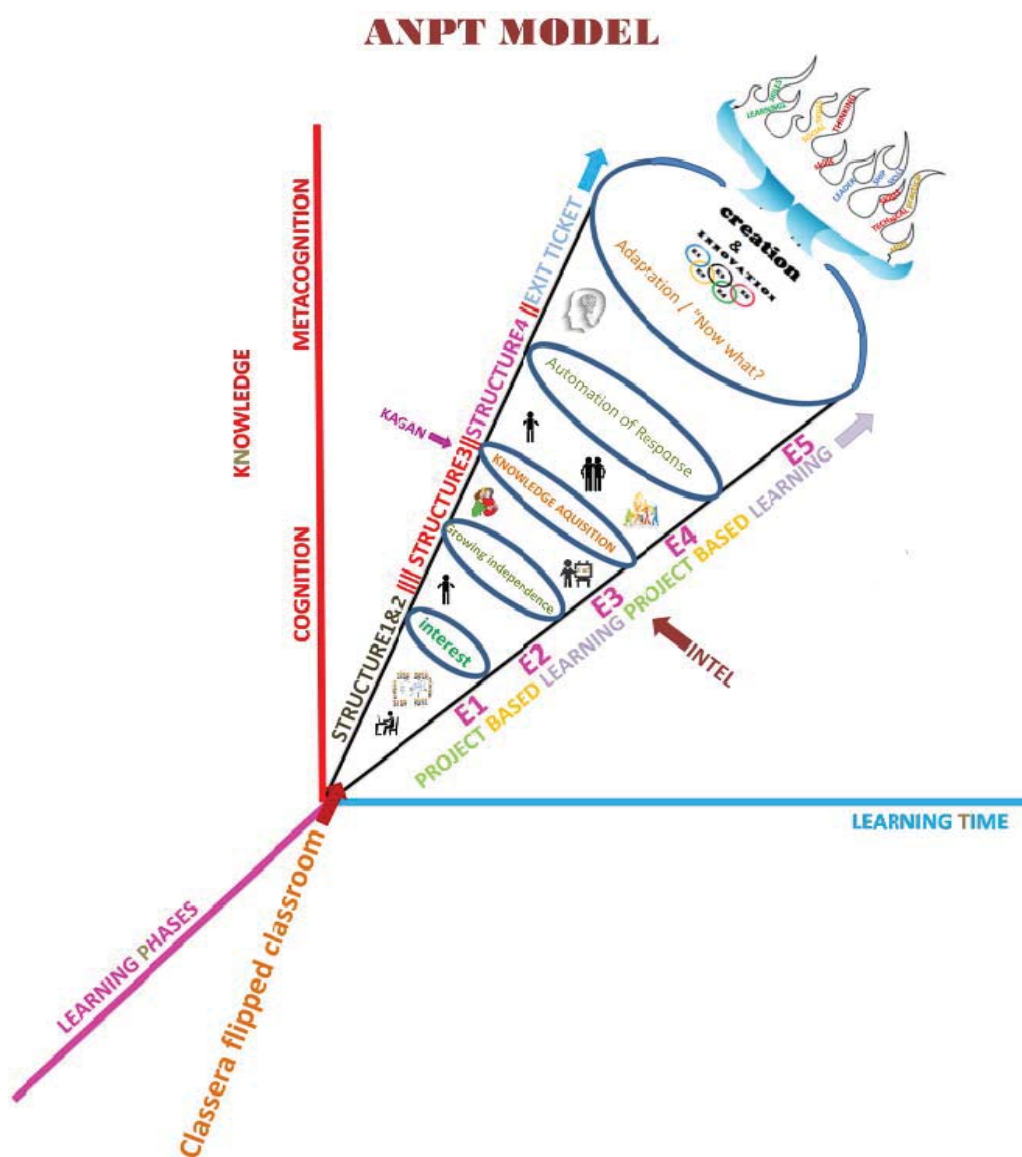

Fig. 1 ANPT Model Diagram

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IV. Data Analysis and Interpretation

We marked the tests and the questionnaires to evaluate the effectiveness index (development) of each of the three approaches ANPT approach, Traditional approach, and ANPT with intel education approach. The results of the pre-test, the post-test, the pre-questionnaire, and post-questionnaire were analyzed in percentages. determine data were analyzed for testing hypotheses and deducing the conclusion and the recommendations.

We use the t-test to test whether there is a significant difference between means of responses of two independent populations. For example, testing the hypothesis whether there is a significant difference between responses according to Sex. The following are the usual steps:

A. The null hypothesis H0: The means of responses of two independent populations are equal. In other words, there is no significant difference between the two means of the responses.

B. The alternative hypothesis H1: The means of responses of two independent populations are unequal. In other words, there is a significant difference between the two means of the responses.

C. We calculate the value of the t-statistic, and the p-value, which is the probability of obtaining the value of t.

D. One can get the decision about the hypothesis by using the p-value. If the p-value is less than or equal $\alpha=0.05$, one can reject H0 and accept H1, i.e. there is a significant difference between the two means of the responses. Otherwise, one accepts H0 and rejects H1, i.e. there is no significant difference between the two means of the responses.

Tables I-IV show the data collected and the statistical analysis of the study

TABLE I
ANPT EFFECT ON ACADEMIC PERFORMANCE

calculations	Groups	
	Experimental	Control
N	22	22
Mean	220.67	90.74
Std. Deviation	244.32	111.22
*t_{42}	2.270	
Sig. (p-value)	0.028	
Conclusion	Sig.	

* t_{42} is the value of the t- statistic at (42) degree of freedom

Table I shows that the p-value (the significance) is less than 0.05. This means that there is significant difference in academic performance development between the students learned by instruction based on "ANPT Model" and students taught by traditional instruction.

Table II shows that the p-value (the significance) is less than 0.05. This means that there is significant difference in "EQ development" between the students learned by instruction based on "ANPT Model" and students taught by traditional instruction.

Table III shows that the p-value (the significance) is much less than 0.05, which means that there is significant difference

in "academic performance development" between the students learned by instruction that use the "Intel contribution in ANPT" and students learned "without the Intel contribution in ANPT".

TABLE II
ANPT EFFECT ON EMOTIONAL QUOTIENT

calculations	Groups	
	Experimental	Control
N	22	22
Mean	10.00	1.13
Std. Deviation	3.55	1.99
*t_{42}	10.218	
Sig.(p-value)	0.000	
Conclusion	Sig.	

* t_{42} is the value of the t- statistic at (42) degree of freedom

TABLE III
INTEL CONTRIBUTION IN ANPT EFFECT ON STUDENTS' ACADEMIC DEVELOPMENT

calculations	Groups	
	Experimental	Control
N	18	18
Mean	80.63	31.72
Std. Deviation	60.67	15.78
*t_{34}	3.310	
Sig. (p-value)	0.002	
Conclusion	Sig.	

* t_{34} is the value of the t- statistic at (34) degree of freedom

TABLE IV
INTEL CONTRIBUTION IN ANPT EFFECT ON STUDENTS' EMOTIONAL QUOTIENT DEVELOPMENT

calculations	Groups	
	Experimental	Control
N	18	18
Mean	8.66	4.30
Std. Deviation	5.51	1.94
*t_{34}	3.167	
Sig. (p-value)	0.003	
Conclusion	Sig.	

* t_{34} is the value of the t- statistic at (34) degree of freedom

Table IV shows that the p-value (the significance) is much less than 0.05, which means that there is significant difference in "EQ Development" between the students learned by instruction that use the "Intel contribution in ANPT" and students learned "without the Intel contribution in ANPT".

V. Conclusion

Based on the findings of this study, the conclusion can be made that

A. Generally

There is a significant correlation between "the academic performance development "and the "emotional quotient development" hence the correlation quotient ranges from 0.29 which is considered as a "weak positive correlation" to 0.8 which is considered as a "strong positive correlation".

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B. For "ANPT" Effect Study

1. There is a significant statistical difference in the Academic Performance Development between the students learned by the instruction that uses the "ANPT" Model and the students taught by the traditional teaching (i.e., "ANPT" Model supports the academic performance development).

2. There is a significant difference in the Emotional Quotient development between the students learned by the instruction that uses the "ANPT" Model and the students taught by the traditional teaching (i.e., the "ANPT" Model supports the Emotional intelligence development).

C. For "Intel Contribution" Effect Study

1. There is a significant difference in academic performance development between the students learned by the instruction that uses the "Intel Contribution in ANPT" and the students learned without "Intel Contribution in ANPT" (i.e., "Intel Contribution in ANPT" supports the academic performance development).

2. There is a significant difference in the Emotional Quotient development between the students learned by the instruction that uses the "Intel Contribution in ANPT" and the students learned without the "Intel Contribution in ANPT" (i.e., "Intel Contribution in ANPT" supports the Emotional intelligence development).

D. Comparing the Effect Size

1. Comparing the effect size between the academic performance development and Emotional Quotient Development, the Emotional Quotient Development effect size is smaller because the emotional intelligence components grow slowly.

2. Comparing the effect size between the "ANPT" Model and Intel Education contribution in ANPT" the separate "Intel Education contribution in ANPT" effect size is smaller because "Intel Education contribution in ANPT" is one of the "ANPT" Model components (i.e., the cooperativity of the ANPT constituents causes the large effect size).

VI. RECOMMENDATIONS

Based on the above-mentioned conclusions, we recommend the following:

A. Applying the strategies that increase the emotional intelligence and the academic performance development in their context such as ANPT Model that includes the Intel contribution either by the Intel tablet, that supports the learning process by no fear of being broken easily besides all the advantages that made it a successful tool for inquiry and project based learning, or by the software that enables the teacher to guide his class smoothly (i.e., classroom management) and the student to interact as a researcher.

B. Applying the "Intel education contribution in ANPT" in smart learning of both the theoretical and the practical subjects.

C. Doing a longitudinal study to assure the effectiveness of this model on learning and other related variables.

VII. ADDENDUM

A. **Intrinsic motivation**: The motivation the individual gets from achieving a task that meets his interests and needs (i.e. the locus of control is internal not external)

B. **The 5e learning cycle**: The 5e learning cycle is an instructional design model that defines a learning sequence based on the on the experiential learning philosophy of John Dewey and the experiential learning cycle proposed by David Kolb. Attributed Roger Bybee of the Biological Science Curriculum Study (BSCS) the model presents a framework for constructivist learning theories and can be effectively used in teaching science. [11]

C. **Growing independence**: The learner is less dependent on external assistance. The performance begins to become internalized (self-directed speech). [12]

D. **Automation of Response**: Performance is developed, automated, and internalized. Assistance from others and self-directed speech are unnecessary and may be irritating. [12]

E. **Knowledge acquisition:** The process of extracting, structuring and organizing knowledge from one source, usually human experts. [13]

F. **Adaptation:** Adaptation is based on a cycle in which the learner attempts to first correct or extend its reflective knowledge (which is essentially a multi-level domain theory), and then use the reflective knowledge as a basis for correcting its deliberate and reflex knowledge (which in turn influences which goals it can achieve in the world and can lead to the need for more extensions and corrections to its reflective knowledge, completing the cycle). [14]

G. **Flipped classroom:** When teachers flip the classroom, they deliver learning content outside the classroom and free up class time for a level of differentiation and personalized learning that is hard to pursue in a traditional lecture-oriented classroom. It also provides time for Active Learning. [15]

H. **Vygotsky theory:** By helping the student when they only need to be helped then they will learn the process for themselves instead of relying too much on the help of others. [16]

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