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improve attention and hand coordination of children with learning disabilities using computerized approaches(*)

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Abstract:

Computer Assisted Instruction (CAI) is considered as an effective teaching-learning strategy for the effective plan, written and programmed in the computer that can be run in a several computer units and allows every student computer terminal. The instruction are programmed with the implementation of a computer disc (CD) played in audio, video, gaming, drag & drop, and simulation activity of students in their own pace. In the contemporary world the CAI is not underestimated with the instructional computer value. In human body disability is observed as the difficulty of the human body function. In Learning Disability (LD) is heterogeneous disorder groups with significant difficulties in acquisition for listening, speaking, reading, writing and reasoning. This research examined the contribution of CAI on the LD students. The analysis is based on the data collected from the LD diagnosed school students. The data were collected from the Special school in Riyadh in Saudi Arabia with the data collected from 245 sample students. The experimental analysis is conducted for the experimental and control group. The analysis is conducted based on the consideration of three variable such as hand-eye co-ordination, attention and academic performance. The analysis of data expressed that through CAI model the LD student eye-hand co-ordination, attention and academic performance is improved.

Keywords: Computer-Assisted Instruction (CAI), Learning Disability (LD), Attention, Academic Performance.

تحسين الانتباه والتآزر اليدوي للأطفال الذين يعانون من صعوبات التعلم باستخدام المناهج المحوسبة

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الملخص

لا يمكننا التقليل من القيمة التعليمية لأجهزة الكمبيوتر في عالمنا المعاصر، وخاصًا في مجال صعوبات التعلم (LD) فهي مجموعة غير متجانسة تبدو لدي الفرد في صعوبات اكتساب مهارات الاستماع والتحدث والقراءة والكتابة والتفكير صعوبات؛ يعتبر التدريس بمساعدة الكمبيوتر (CAI) بمثابة استراتيجية تعليمية وتعلم فعالة سواء كانت مكتوبة أو مبرمجة في الكمبيوتر والتي يمكن تشغيلها في عدة وحدات كمبيوتر، وتسمح لكل طالب باستخدامها على حسب قدراته، ويسعي هذا البحث إلى الكشف عن مدى مساهمة (CAI) في تعليم طلاب ذوى صعوبة التعلم، تمت برمجة التعليمات باستخدام قرص كمبيوتر (CD) يتم تشغيله في أنشطة الصوت والفيديو والألعاب ومحاكاة الطلاب بالسرعة التي تناسبهم، كما يعتمد البحث الحالي على تحليل البيانات التي تم جمعها من طلاب المدارس الذين تم تشخيصهم بصعوبات التعلم، تم جمع البيانات من مدارس خاصة في الرياض، المملكة العربية السعودية، وتألفت عينة الدراسة من 245 طالب وطالبة، وتم إجراء التحليل التجريبي على المجموعة التجريبية والمجموعة الضابطة، واستند التحليل إلى ثلاثة متغيرات: التآزر بين اليد والعين، والانتباه والتحصيل الأكاديمي، أظهر تحليل البيانات أن التدريس بمساعدة الكمبيوتر (CAI) يساعد على تحسين التآزر بين اليد والعين والانتباه والأداء الأكاديمي للطلبة ذوي صعوبات التعلم (LD).

الكلمات المفتاحية: التدريس بمساعدة الحاسوب (CAI) – صعوبات التعلم (LD) – الانتباه – الأداء الأكاديمي.

1. Introduction

Learning Disability (LD) is described as a specific learning disorder in the children or person who have trouble in learning and understanding specific skills. (Schwartz, Hopkins & Stiefel, 2021) LD is stated as the group of disorders that affects people interpret ability towards seeing, hearing or linking the information at different parts of the brain. In other terms, LD is stated as the neurological disorder those affects the reception, process, storing and responding the information (Mezzalira, et al, 2021). Generally, the LD is termed as the unexplained difficulty for the person towards acquiring basic academic skills with the average intelligence level. The skills those affect the LD are listening, reading, writing, reasoning and problem-solving. (Allam & Martin, 2021) However, the LD varies from person to person whereas the one person with LD does not exhibits the similar characteristics for another people. With interpersonal relations based special education in students' problem solving is improved with adequate classroom enjoyment and activities. The psychological security and safety are considered as the exploration instructional tasks for students with LD. (Gartland & Strosnider, 2020) The cohesion in the class is based on the establishment of interpersonal relationships between children with LD and academic activities (Ok, Bryant & Bryant, 2020).

Special education with the instructional approach offers the significant outcome for the specified, explicit, design and instructional needs in the development (Roberts-Tyler, Hughes & Hastings, 2020). Although those instructional approach does not offer unique setting, teachers and education for the application requirements. (Lockwood, Farmer, Winans & Sealander, 2022) Special education setting with an explicit, intensive and supportive approach provides effective outcome in the LD students. Ton increase the outcome of the students teachers precedence needs to monitor the progress based on the instruction features, group size, time, material and instructional practices. (Cheng, & Lai, 2020) The LD people are not smart workers, with minimal motivation and self-esteem. Through the sense relationship need to be enriched for the increases in the development of LD. (Alexopoulou, Batsou & Drigas, 2021) The people with LD need to withstand the cognitive, emotional and creative aspect of instruction-based approach for the development. In developing countries special education comprises of the separate classroom for the children or person with disabilities. (Leko, Cook & Cook, 2021) The segregated educational highlights the issues in the children with DL. Education system with inclusive characteristics difficulty associated with the curriculum and testing methods.

The children with integration comprise of the mainstream in the classroom for the resource adoption. The LD model with the pre-existing

structure and unaltered environment affects the mainstream in classroom inclusion. The inclusion in the classroom increases the quality of life of children with LD. (Olakanmi, Akcayir, Ishola & Demmans, 2020) Through the developmental current programmes subjected to insufficient or inappropriate marginalisation for the LR management. Special education model aimed to marginalized the functioned mainstream outside through special programmes, institutions and educators. With educational opportunities second-rate does not offer guaranteed possibility, differentiation for the discrimination form those are of special need to the mainstream in special education. (Cheng & Lai, 2020) Inclusive education system comprises of the learning facilities for the youth and adult children those focus on the vulnerable marginalisation and exclusion. Inclusion is based on meeting and interactive communication to increase the overall quality of life with LD. With advancement in computer-assisted curriculum model encourages the present programmes those are insufficient or inappropriate for the children with special needs to marginalisation and exclusion. With marginalized target process with computer-assisted curriculum it is expected that new advancement in the special programmes, institutions and educators. (Serin Novica & Hidayat, 2021) Inclusive education model comprises of the learning model in children, youth and adults with the specific process in LD.

In 1962, the Saudi Arabian Special Education Unit was established by the Ministry of Education to provide rehabilitation and educational services to individuals who were intellectually disabled, deaf, hard of hearing, or blind but not otherwise served. (Gilmour, 2020) According to Pua, Peyton, Brownell, Contesse & Jones, (2021), the Saudi government established three institutions in Alhofouf, Aneaza, and Mecca in 1964 to cater to the particular requirements of people who are blind or visually impaired. The Special Education Unit of the Ministry of Education provided assistance and oversight to each of these institutes, which together formed the Al-Noor Institute. The Ministry of Education provided funding and oversight for the first three educational establishments, the Al-Noor institutes. People didn't know enough about learning disabilities before R. A. Aldabas 1161 in 1990 made these services available. (Bansal & Singh, 2021) As a result of the educational placement provided by these specialized classrooms, the students have received special education services. In some public schools, students with mild to moderate disabilities like autism, intellectual disabilities, and hearing impairments continue to enroll in special education classes. In fact, there are 47 programs for students with mild to moderate autism and 746 special education classrooms for students with mild to moderate disabilities like intellectual disabilities and multiple disabilities in

public schools all over the country. According to the Saudi Ministry of Education, there are approximately 316 programs for students who are deaf or have hearing impairments in Saudi Arabia's public schools and 171 programs for students who are blind or have visual impairments. (Alqahtani, Alshuayl & Ryndak, 2021) (Gibbs& Bozaid, 2022).

This research evaluated the role of the computer-assisted model in the evaluation of the student's performance on the LD. The evaluation is based on the consideration of three variables such as eye-hand co-ordination, attention, and academic performance. The statistical analysis expressed that the computer-assisted model increases the performance of LD students. The statistical analysis concluded that computer-based model increases the performance of the LD students. The paper is organized in 5 sections with overall background is presented in section 1 and related works are given in section 2. The research methodology is provides in section 3 and statistical analysis tools are presented in section 4. The discussion is presented in section 5 and overall conclusion in section 5.

2. Related Works

The process incorporated in the design of the learning process to increases the quality of person life with LD are presented. In Almalki, Alqabbani & Alnahdi, (2021) stated that the disability of children does not related to academic standard of the people. The analysis stated that the special education services receive the supports services to achieve the proficiency in the academic performance. The eligibility criteria for the special education comprises of the low expectation for the students with minimal disabilities to derive the pervasive behaviour in children. In Alnahdi, & Schwab, (2021) evaluated the special need student performance those have greater access in curriculum, accommodation, support and expectations. The increase in number of disabilities in student with special need requires appropriate class room. With diverse teachers prepared engage academic performance to achieve significant result disabilities in students. With inclusive restructuring school structure to perform collaboration in skills, differentiation and classroom coordination for the teacher's success.

In Aldabas, (2021) demonstrated the effectiveness in the disabilities of students based on inclusive settings those are higher than pull-out student disabilities. In Kim & Xin, (2022) examined the student's performance with disabilities with high class school those are comparable in passing rate between the education students and disabilities. It is observed that student behaviour with the disabilities subjected to educational class for the severe cases. The students' disabilities do not exhibit the adverse effect in the education student. In Kelley, Hurry & Clark, (2021) evaluated the classroom education scenario to improves the opportunities among the students with

minimal disabilities in learning. The achievement in education of LD exhibited that the children with minimal disabilities exhibits minimal achievement in academic students with integrated programs. The performance is relatively minimal for the education students with integrated resource programs compared with the minimal achievement in classmate but not higher social success in education.

In Balint-Langel, et al, (2020) evaluated intellectual, social functioning, environment interaction between 43 class students 14 schools. The results stated that there is no significant difference between traditional domain for the students' performance with self-help skills, communication, motor skills, adaptive, fine skills and gross skills. With functional domain competence is achieved with social form integrated with sites based on the management of ability through own behaviour for the social situation. Conversely, the segregated sites with children regressed with traditional domain skills and competence. The results demonstrated that those students are in segregated sites not receives greater concentration on special educational resources with integrated settings. In Tsikinas & Xinogalos, (2020) evaluated the contextual approach for the inclusive education with conceptualized government policies and practices in special education. The analysis states that data were collected through interview and document form. The findings expressed that inclusive education provides the effective policies for school, special education and counsellors. The inclusive education provides the effective synonymous characteristics for the children with disabilities for the inclusive education, schools and child. The results expressed that variation and discrepancies are not observed with the policies, staffs and schools respectively. With visible changes children with responsibilities are occurred effective in persisting ambiguities education in a contextual manner for the children education with disabilities are critical for the inclusive education. In Nakeva, Kalnak & Jennische, (2021) conducted a inclusive education policies for the children with disabilities. The analysis expressed that education is considered as the primary tool for the evaluation of social and economic development in the societies. The children with education subjected to laten supplement for the lagging for the peers with the minimal fraction in the disabled children with minimal number of constraints.

3. Research Method

The present research examines the through computer-assisted model how the LD student performance is improved. Initially, the children with any king of disabilities have the lack of hand-eye co-ordination, concentration and eye contact. To overcome those difficulties computer-assisted curriculum comprises of interaction with LD students to improve the hand-

eye co-ordination to increase concentration of students. Upon the computation process of the present research is experimental in nature with consideration of methods such as pre-test, post-test and control group design. In the experimental design the manipulation of research comprises of independent and control variables.

3.1 Study Area

The data for analysis is collected in Riyadh, Saudi Arabia. The Special school comprises of the 3 schools for the analysis.

3.2 Sample Size

The data for analysis is collected from the special education school in Riyadh with the total sample of 245 students those are diagnosed as the LD in the age of 5 -11 years. The data for analysis is collected from the special school in Riyadh. Among those 245 sample student 120 children's are inclusive and special schools. The selected sample population have the LD those are identified based on the consideration of certain limitations those are presented as follows:

1. Teacher's diagnosis as LD
2. The students with below 65 LQ are not considered
3. Children those are in the age group of 5 -11 years
4. The children with severe LD are not considered
5. Children with learning disability alone considered in the analysis.

3.3 Procedure of Sample Selection

The sample are selected based on the children with the LD in the inclusive and special schools. Initial step in selection of sample are information gathering from teachers those have minimum one year experience. Through the referral from the teachers about LD the respective school authorities' permissions are obtained. The selected schools are co-educational in nature with the sample of boys and girls with the LD.

3.4 Tools and Techniques

The collected data were processed by the researcher to examine the administration, interpretation and complexity. The research reliability relies on the collected data tools, test scales and techniques. The research tools comprises of the types those are objective based on the sample design for the specific tools. The assessment among the children is evaluated based on the computer-based curriculum model for the increasing the performance of children in LD. The assessment is based on the consideration of following variables those are:

1. Test for co-ordination of hand and eye in LD children
2. Test for concentration and attention in LD
3. Evaluation of academic performance

3.4.1 Techniques

The techniques implemented for the examination of children behaviour are evaluated with inclusion of computer-assisted curriculum in children. The analysis is based on the consideration of evaluation of hand-eye coordination in children and concentration level. Also, the LD severely impacts on the academic performance of children those are evaluated.

3.4.2 Observation

The present technique used to evaluate the behavior of children body language with LD in inclusive and special schools. Time sampling is utilized for the observations. The hand-eye co-ordination, concentration and academic performance are evaluated.

3.4.3 Questioning

To derive the relevant information related to children selection is performed based on the exclusion criteria and questions are asked for the teachers, special educators and parents.

3.5 Evaluation

The present research is experimental process with comprises of the different steps and procedures.

The present experimental study was conducted by adopting the following scales such as eye-hand co-ordination, attention and concentration and academic performance. The experimental analysis is conducted in four groups with two experimental and two control groups.

The experimental groups are EI (Education in inclusive school) and ES (Education in Special School). The process measures the LD children in inclusive and special school. The control groups are CI (Control in inclusive school) and CS (Control special School). Based on the pre-test intervention is evaluated for the school setting for the EI and ES without miss periods. The collaboration between the groups are conducted based on the 40 sessions with the duration of 35 -40 minutes with the two activities. The computer based visual learning is planned for the alphabets and numbering for the identification. The intervention session is conducted to minimize the gap of holidays and other activities in the school. The identified children are evaluated to evaluate the reason of selection to assist the researcher study completion for the students improvement.

3.6 Treatment - Collaboration as a Remedial Strategy

With computer-assisted model the collaboration activities are included for the shared meaning, agenda and development in the cooperative way in the curriculum. Through collaboration and peer collaboration treatment methods are deployed for the collaborative learning process with the computer-assisted model as the effective strategy. The computer-based

curriculum model comprises of different academic activities such as games, short stories, routine activities, puzzles, alphabets, numbers, drawing, environment, traffic lights and so on. The computer-assisted activities in the curriculum of the LD are presented as follows:

1. Games on computer and co-curriculum activities
2. Academic Activities in song and video clips
3. Videos about mathematics and common manners
4. Environmental Awareness videos of planting trees, cleaning and etc
5. Flash cards on computer for the identification and problem solving

Based on the above stated computer-assisted activities the LD students are trained for the performance. The statistical data collected and evaluated for the outcome estimation.

4. Results and Discussions

The data collected from the selected students and teachers are evaluated with the use of statistical analysis tools and techniques. The analysis of data is examined based on the consideration of statistics such as mean (M), Analysis of Variance (ANOVA), test of comparisons (t-test), standard deviation and graphical analysis.

The primary objective of this research is to evaluate contribution of computer-assisted curriculum for eye-hand co-ordination in children with LD with the statistical characteristics. The computation is based in the sample statistics for the computation of measurement of significant computation in statistical factors. The measurement probabilities are computed with the statistical different those provides the true difference in the mean population count. The fluctuation in the sample is computed based on the non-significant difference in the population. The real difference value is computed based on the confidence interval with 0.05 interval for the normal distribution that less than 1.96 and 0.01 level area with normal distribution value beyond 2.58 in two extremes. The statistical analysis is evaluated with examination of academic performance, eye-hand co-ordination and attention of the students. The special school student performance with LD is evaluated to increases the classroom and academic behaviour in the children with LD for special schools. The LD process with computer-assisted curriculum increases the Academic Performance, coherence and minimizes the Eye-hand co-ordination in the special school. The data analysis is measured with mean, standard deviation, percentiles, kurtosis and skewness. Through generalized statistical analysis particular performance particular groups are derived without any derivatives and similarities measurement in the group. Hence, with the inferential t-test observations is based on the samples. The present research evaluated the pre-test, post-test and delayed post-test values in the three experimental

groups. The observation is performed with the appropriate data set with the parametric analysis of variance (ANOVA) data. Parametric analysis is conducted with the basic assumptions with the population distribution for the quantify data or observations. The parametric analysis expressed that computer-assisted curriculum increases the LD students hand-eye co-ordination, attention & concentration and academic performance presented in table 1.

Table 1: Test of Homogeneity of Variances

Group (Size)	Eye-hand co-ordination			Attention/Concentration			Academic Performance		
	Within groups SS	Variance (MS)	F-ratio (largest var./ smallest var.)	Within groups SS	Variance (MS)	F-ratio (largest var./ smallest var.)	Within groups SS	Variance (MS)	F-ratio (largest var./ smallest var.)
EI (30)	1226.8	42.30	**1.77 (p> .05)**	732.16	25.24	**1.48 (p> .05)**	1872.16	64.55	**1.83 (p> .05)**
CI (30)	691.86	23.85		531.86	18.34		902.8	31.13	
ES (30)	998.96	34.44		522.96	18.03		830.3	28.63	
CS (30)	794.8	27.40		494.16	17.04		870.96	30.03	

The above table 1 shows that Barlett's evaluate the homogeneity of variance utilized for the identification of sample. Through computer-assisted curriculum the hand-eye co-ordination it is observed as 1.77 with division of largest and smallest variance with df value of 29. The critical value measured for the 29 as 1.858 with the value a =0.05. This implies that variance of extreme are significant and control groups are homogeneous. In the coherence the observed F value is measured as 1.48 with the df value of 29 (0.05) and a = 1.858 those are insignificant. This implies that observed

groups are homogeneous with the two extreme variance those does are not significant. The academic performance and attention value is measured as 1.83 df = 29 with the a = 1.858 those are insignificant. The difference in variances are two extreme those are homogeneity with the groups are presented in table 2.

Table 2: LD in Inclusive & Special Schools

			Pre Test				Post Test			
			Mean	SD	Sk	Ku	Mean	SD	Sk	Ku
EYE-HAND CO-ORDINATION	Inclusive schools	Experimental group	116.16	6.86	0.04	0.26	122.63	6.73	0.01	0.275
		Control group	116.03	4.55	0.13	**0.28**	116.13	5.30	0.02	0.265
	Special schools	Experimental group	115.03	5.87	0.214	0.286	115.57	6.02	0.09	0.265
		Control group	115.2	5.23	0.214	0.286	115.23	5.32	0.11	0.274
Attention/Concentration	Inclusive schools	Experimental group	107.83	5.02	0.23	0.283	112.27	5.20	0.07	0.276
		Control group	107.73	4.28	0.33	0.293	107.97	4.43	0.33	0.283
	Special schools	Experimental group	106.37	4.24	0.12	0.276	107.13	4.92	0.19	0.284
		Control group	106.17	4.13	0.23	0.284	106.57	3.65	0.14	0.264
ACADEMIC PERFORMANCE	Inclusive schools	Experimental group	129.93	8.46	0.2	0.274	138.47	8.32	0.3	0.282
		Control group	129.8	5.58	0.14	0.286	130.1	6.54	0.16	0.264
	Special schools	Experimental group	127.73	4.00	0.01	0.290	128.27	4.35	0.19	0.288
		Control group	127.57	4.82	0.07	0.271	127.83	6.10	0.04	0.267

In present research total sample considered N = 120 values for each group those are equal to 30. The skewness value is identified that those value is lie within the range ±1 those are slightly platykurtic. In table 2 the LD student performance is evaluated for the computer – assisted curriculum activities such as mean, standard deviation, skewness and kurtosis related to

eye-hand co-ordination, concentration and academic performance characteristics. The skewness score expressed that for all three variables both experimental and control group score are normal distribution. Hence, it is observed that parametric test is performed for the different treatment and conditions with variation in group as shown in table 2. With ANOVA analysis additive those changes ultimately those affects the variations between groups. Through the assumptions of normality, the ANOVA provides the validation.

4.1 DESCRIPTIVE ANALYSIS OF THE DATA

The analysis of variance evaluate the traditional and collaborative methods for the inclusive and special schools. The analysed data is evaluated with the analysis of variance as presented in table 3.

Table 3: Analysis of ANOVA

Source of variation	df	SS	MSS	F
Treatment	I	.008	**.008**	.00
Types of School	I	29.00	29.00	.894
Group * Types of School	I	.675	.675	**.021**
Error	**116**	**3762.9**	**32.44**	

Table values oft at .05= 3.93; at .01=6.88; for df=l 16

In table 3 the F-value between the groups is computed for the experimental and control groups with the F=.00, df= 1/116, p>.01 those are not significant. With collaborative learning groups with LD the eye-hand co-ordination, attraction and academic performance are not significant compared with the traditional methods. The table 4 provides the pre-test score of eye-hand co-ordination value of 115.6 almost similar to that of traditional methods with the academic achievement level of 115.61. Therefore, the pre-test stage value those are significantly differ in the traditional and collaborative learning methods. The two-way analysis of variance are examined for the data those are presented in table 4.

Table 4: Analysis of Variance

Source of variation	df	SS	MSS	F
Treatment	I	350.20	350.20	10.14**
Types of School	I	476.00	476.00	13.79**
Group * Types of School	I	285.20	285.20	8.26**
Error	**116**	**4003.16**	**34.51**	

Table values oft at .05= 3.93; at .01=6.88; for df=l 16

The control group and experimental value of schools are post-test value of t-value as presented in table 5.

Table 5: post-test t-value

Groups	N	Mean	Difference in mean	S.D	t-ratios
EG(Total)	60	120	3.43	7.48	3.04**
CG(Total)	60	116		5.84	df=l 18
El	30	122.63	6.5	6.73	4.09**
Cl	30	116.13		5.30	df=58
ES	30	116	0.37	6.23	0.28
CS	30	116		5.57	df=56
EI	30	121.55	7.06	6.46	4.37**
ES	30	117.47		6.29	df=58
CI	30	119.47	0.9	5.75	0.69
CS	30	118.94		5.28s	df=58

Table values oft at .05= 1.98; at .01=2.622; for df=l 18
Table values oft at .05 = 2.002; at .01= 2.664; for df=58

As presented in table 5 the experimental group provides the higher mean value for the hand-eye co-ordination for the control group those are not intervention. Between the two groups the difference is measured as 3.42 those are significant t=2.94; p<**0.01.** The examination expressed that LD students achieves higher academic performance compared with the control group in the post test level those comprises of the intervention strategy. The t-ratio measured in the academic performance for the post test stages in the control group as presented in table 6.

Table 6: Post test evaluation

Groups	N	Mean	Difference in mean	S.D	t-ratios
EG(Total)	60	134.56	4.56	8.47	3.37**
CG(Total)	60	129.56		6.48	(df=119)
El	30	138.47	8.37	8.32	4.27**
Cl	30	130.1		6.54	(df=58)
ES	30	129.45	0.79	4.46	0.38
CS	30	128.46		6.28	(df=58)
EI	30	139.46	10.67	8.48	5.89**
ES	30	129.46		4.49	(df=58)
CI	30	130.33	2.35	6.49	1.43
CS	30	128.45		6.28	(df=58)

Table values oft at .05= 1.98; at .01=2.622; for df=l 18
Table values oft at .05 = 2.002; at .01= 2.664; for df=58

The table 9 provides the subjects with the experimental group those have higher mean score value based on the academic performance in post test level in the intervention of control group. The difference is measured as 4.4 between the two groups are measured as t = 3.26; p<0.01. The academic performance is better for the EGT group with the academic performance

compared with the control group intervention strategy. The experimental analysis states that relationship between peers are increased with the problem solving and co-ordination. Thus incorporation of computer-based curriculum increases the academic performance of the students with LD. The pre test and post test evaluated for the control group experimental behaviour for the t values as presented in table 7.

Table 7: Evaluation of pre-test and post -test

Groups	N	Mean	Difference in mean	S.D	R	t-ratios
EG(Total)	Pre test	138.56	4.65	6.58	0.89	7.27** (df=59)
	Post test	134.66		8.67		
CGT	Pre test	129.45	0.33	5.34	0.91	0.81 (df=59)
	Post test	129.45		6.46		
E1	Pre test	130.89	8.63	8.58	0.89	11.35** (df=29)
	Post test	139.67		8.63		
Cl	Pre test	131.45	0.35	5.63	0.83	0.58 (df=29)
	Post test	132.35		6.59		
ES	Pre test	128.45	0.56	4.34	0.89	2.13* (df=29)
	Post test	129.35		4.38		
CS	Pre test	128.46	0.28	4.75	0.78	0.45 (df=29)
	Post test	128.67		6.24		

Table values of t at .05= 2.00; at .01=2.661; for df=59
Table values oft at .05 = 2.04; at .01= 2.76; for df=29

In the table 7 the experimental group of LD provides the significant performance for the pre and post test characteristic. The analysis provides the mean value of 4.54 for the pre test and post test level, The mean value is measured as the 4.54 for the experimental group with the gain value of t= 7.07; p<0.01. The analysis confirmed that with collaborative learning with LD children the mean value is increased with 4.54 for the experimental group level. The gain is measured as the t= 7.07; p<0.01. The experimental results stated that that with computer assisted curriculum increases the academic performance of students with LD. The analysis inferred that experimental group higher performance value of t= 7.07; p<0.01. The analysis stated that computer-assisted curriculum increases the academic performance of the students with LD. The examination inferred that collaborative learning strategy increases the academic performance with increased attention for the LD students with the negligible score value of 0.29 for the pre test and post test score value for the control group of t= 0.75; p> 0.05. The increase in mean value of experimental group provides the mean of 8.54 for the experimental group t= 11.03; p<0.01. Experimental group achieves the higher intervention for the post test level with the significant difference in school performance. The examination conformed

that LD students increases the academic performance of the students. The experimental analysis for the pre-test and post-test analysis is presented in table 8.

Table 8: t-test for correlated Academic Performance

Groups	N	Mean	Difference in mean	S.D	r	t-ratios
EG (Total)	Post test	132.27	0.83	8.24	0.89	2.14* (df=59)
	Delayed Post test	132.18		8.68		
CGT	Post test	127.64	1.47	6.42	0.91	5.68** (df=59)
	Delayed Post test	128.35		6.46		
E1	Post test	138.47	1.49	8.32	0.92	2.36* (df=29)
	Delayed Post test	139.96		8.35		
Cl	Post test	133.34	1.14	6.48	0.94	2.64* (df=29)
	Delayed Post test	130.45		6.58		
ES	Post test	130.89	0.14	4.43	0.96	2.54* (df=29)
	Delayed Post test	129.34		4.23		
CS	Post test	126.43	2.00	6.34	0.96	5.87** (df=29)
	Delayed Post test	126.34		6.28		

Table values oft at .05= 2.00; at .01=2.661; for df=59
Table values oft at .05 = 2.04; at .01= 2.76; for df=29

In table 11 the experimental group provides the increased value of 0.81 for the post and delayed post test in the academic performance. The significant value in difference is measured as t=2.19; p. <0.5 with the count of 16 measured for the examination of LD students with attention and academic performance. The control group performance is decreased as 1.53 for the post test difference of t=5. 70; p<0.01. The control group subject does not achieve the adequate intervention for the mean those are reduced with the delayed post level with the increased academic performance value. The experimental group academic performance is increased by 1.49 for the post test and delayed post test value. The significant difference is measured as t=2.36, p<0.5 for the collaborative and special education for the classroom behaviour.

5. Discussion

The computer-based collaborative strategy is considered as the effective intervention strategy for the children with LD to increase the eye-hand co-ordination, attention/concentration and academic performance to increase the academic performance of students. The significant difference is

measured for the pre-test and post-test score value through the collaborative learning to increase the attention, co-ordination and academic performance for the children with LD in special school. Through special school the limited performance is measured for the LD have the limited interaction compared with inclusive and opportunistic nature for the regular children for the immerse interaction affects the children without LD.

Through the variation the changes is measured for the eye-hand co-ordination, attention or concentration and academic performance for the experimental groups in inclusive and special education those are not definite in special school. Through the significant performance variation the eye-hand co-ordination is effective for the concentration and academic performance in the experimental group for the inclusive and special schools.

With computer-assisted collaborative classroom model the student with LD able to self-assess them on own to derive the decision making process about materials and performance groups in terms of success, questions, doubts and uncertainties. Furthermore, the concentration is also increased in the students with LD those are difficult in conventional assessment methods. Ideally, the LD students able to assess their own learning process in the group through the social cognitive theories to achieve the social learning compared with the individualized learning process. The present research examined the computer-assisted relationship for the eye-hand coordination, concentration and academic performance in the LD students. With collaborative learning process the LD groups students able to perform the thinking tasks simultaneously to withstand the complexities. The present research supports the socio-constructivist model to increase the interaction and attention to perform the specific action. The interaction process perform the peer interaction coordination to generate superior performance of individual for the generation of post-test performance of LD individual training in new perspectives to achieve significant academic performance. The present results expressed that school characteristics are inclusive those are effective for the discriminate attitude, communities, inclusive society and achievement in academic performance. Moreover, through the efficient computer-based model, the cost-effectiveness is evaluated for the education system for the learning process to achieve effective curriculum academic performance of the LD students.

6. Conclusion

Collaborative learning computer-based curriculum model improves the intervention strategy to increase hand-eye co-ordination, attention and academic performance. The experimental analysis for the pre test and post test provides the effective inclusive school model for the increases the eye-hand co-ordination, attention and academic performance. The mean score

provides the significant difference performance for the pre test and post test model increases the LD student's performance effective performance for the collaborative learning strategy for the academic performance. With intervention based effective inclusive model performance for the special school better performance for the management of the adverse effects on the LD. The collaborative learning process comprises of the inclusive schools offers the significant performance to manage the academic performance model. The special school children exhibit effective interaction for the special school for the minimal performance characteristics. The collaborative computer-assisted learning strategy increases the academic performance of the students with LD for the special school experimental group. The intervention strategy-based model increases the attention of the students with LD for the inclusive school compared with special school with minimal interaction as the essential factors. The inclusive intervention model school provides the effective experimental group, quality education with computer assistance model for the collaborative model with special school in the delayed post test in broader aspects in heterogeneous students.

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