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Cyberbehaviour, Science Process Skills And Academic Achievement In Physics Among Standard Ix Students

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ABSTRACT

The present study investigates on cyberbehaviour, science process skills and academic achievement in physics among standard IX students .Experimental method is used to select a sample of 64 students. The research tools used Cyberbehaviour Student Scale (Developed by the Investigator), Science Process Skills (Zeidan, A.H. and Jayosi, M.R. 2014) and Achievement Test in Physics The results of the statistical analyses show a significant correlation between cyberbehaviour, science process skills and academic achievement in physics among standard IX students. A significant difference was observed among standard IX students pertaining to their cyberbehaviour, science process skills and academic achievement in physics among standard IX students.

Keywords: Cyberbehaviour, Science process skills and Academic Achievement in Physics

1. Introduction

Information and Communication Technology at present is taking different dimensions and rapidly changing in the field of Education. There is expansion of knowledge. Updating knowledge is necessary for student because the student is aware of various types of technology available and with the help of technology he can acquire knowledge. The curriculum needs to be updated continually to take into account. The recent technologies challenge traditional conceptions of teaching learning by restructuring how teachers and learners gain access to in depth knowledge and have the potential to transform the teaching learning process. Through content enrichment programme adequate knowledge about the content can be given with the help of content analysis. Proper content knowledge can create the processing skills in the subject, thereby enabling the student to master in that subject. The duty of the science teacher is to inculcate processing skills among the students in the science subject.

According to Rao (2019), ability or the skill to transfer ones thoughts, ideas and information from the sender to the receiver effectively and efficiently is known as communication skill. They must have better knowledge of how to be a better sender and receiver. Teacher also teaches some communication skill directly through education and practicing those skills and having them evaluated. Teaching-learning is a by-polar process. Teacher teaches and students learn. Teacher is teaching to the students through information. According to Gibbs (1996), Teachers should uplift themselves to survive the demand, threats and challenges within diverse circumstances of teaching inside the classroom. He stated that an effective teacher needs a capacity to be persistent, flexible and innovative towards new teaching approaches and techniques. For strong and effective teaching among the students it is important to understand the impact of psychological attributes on the achievements without which the students cannot perform well in the subject taught.

2. Need for the Current Research

Using technology inside the classroom can help the students to improve their cyberbehaviour. They can use ICT for a meaningful purpose which helps them to monitor and prevent cyber addiction by understanding the cyberbehaviour of the students. In this technological era a teacher who does not integrate computers and multimedia technology will be replaced by a teacher who incorporates them in their method of instruction. The NCF 2005 states that students should be given access to multimedia production equipment to “mix and make their own productions” to present their experiences and “explore their own creative imagination.” This

recommends 'Techno-Pedagogy' as an inevitable part of curriculum transaction. The Techno-pedagogy based instructional procedure leads to innovative learning methodologies that provides

- Better classroom management
- Meaningful access of online and offline resources that can be converted into a usable format as per the need of the learner.
- Optimum utilization and sharing of resources on a global base for the benefit of the students.
- Updated knowledge by tracing recent developments
- An extension to the child from the boundaries of classroom

Rather than looking at education simply as a means of achieving social recognition, the society must view education also as an engine of advancement in an information era propelled by its wheels of knowledge and research leading to development. Thus a need is felt to investigate the lacunae in the effectiveness of teaching Physics through the Techno-pedagogy using interactive whiteboard and thereby understand the psychological attributes such as cyberbehaviour of students and their Science process skills to erudite the concepts of Physics.

3. Review of Related Literature

Studies reviewed pertaining to the present study have been compiled and presented below under appropriate headings.

3.1 Studies Related to Cyberbehaviour and Academic Achievement In Physics

Rowan (2010) described that the following technology addiction prevention guidelines for parents with young children's: (a) Limit technology use to 1-2 hours per day (b) Exercise for 3-4 hours per day (c) Listen, hugs, bedtime stories (d) Removing TVs from bedrooms, no "tech dinners" Sundays and holidays (e) No technology at school recess. These may also be adapted as goals for therapeutic purposes.

Suresh et al. (2018) conducted a study on "Internet addictive behaviours and subjective well-being among 1st year medical students." As the level of I.A. increased, subjective happiness experienced also decreased. Students having no access to internet experienced more subjective happiness.

Galarosa, and Tan (2022) used a sequential explanatory mixed-method research design. Results showed that students' academic performance in pretest is very low, however, as they were exposed to MCLE, post-test and retention test results yielded high. MCLE has potentially increased students' academic performance. Among the motivational factor, students' self-efficacy was improved and their assessment anxiety was reduced as exposed to MCLE. However, motivational factors such as intrinsic motivation and personal relevance, grade motivation, and self-determination weren't improved as exposed to MCLE, but the mean interpretation remained at "highly motivated". In the same way, the overall mean of students' motivation slightly declined after the intervention but was recognized at the level of high motivation. There is a significant difference in the pretest-posttest and pretest-retention test. MCLE significantly increased students' academic performance from pretest to posttest and pretest to retention test. There is a significant difference in the overall motivation before and after the intervention of MCLE. Qualitative results revealed that students find MCLE as a good strategy to provide ease in learning Physics, however, students identified some external factors such as household-related tasks and intermittent internet connection as major distractions in a cybergogy learning environment.

Evaluation

The review shows that some personality traits, such as communication, cyber addiction, parenting attribute, craving for online and lack of thinking about future consequences of actions. There is no much review on personality traits and emotions related to cyber and network security behaviours in one framework. The battery of tests should include cognitive processes with consequences of actions. Furthermore, some psychological methods can increase pro-security behaviours, such as rewarding and penalizing security-related behaviours, using novel polymorphic security warnings, and using psychological methods to increase thinking about future consequences of actions. Cognitive training methods can be used to ameliorate the behavioural traits and help improve cyber behaviours. These findings and the importance of the variable in influencing the academic achievement of students made it necessary to continue the investigation in the Indian context.

1.2 Studies Related to Science Process Skills and Academic Achievement In Physics

Siregar et al. (2020) carried out a research study on improvement of integrated science process skills using scientific inquiry models with algodoo media and quotient adversity in high school students. A quasi-experimental pre test-post test design was employed for the study. The sample comprised of 80 students of X th grade. Sampling was done by cluster random sampling technique. The data collecting tools were essay tests of integrated science process skills and adversity quotient with a questionnaire statement list. Data was analyzed using two way ANOVA. The findings revealed that the scores of students' integrated science process skills and adversity quotient taught using scientific inquiry models with algodoo media were better than the scores of students taught through conventional method.

Wiyoko et al. (2021) conducted a study on improving the integrated science process skills and learning outcomes via quantum learning model. Random sampling technique was used. Pre-test post test control group was used as research design. The results showed that using quantum learning model, the learning outcomes and process skills were enhanced.

Evaluation

A scrutiny of the above mentioned studies revealed that process skills play a vital role in learning science. Different investigators used different interventions to enhance the science process skills. A research study conducted by Jannah et al., (2021) advocated that virtual laboratory assisted discovery learning was effective in improving the process skills in science. Haryadi et al. (2020) found that PhET interactive simulations technology significantly improved the integrated science process skills. Harahap et al., (2019) explored that blended learning technique was found to be significantly more effective in enhancing students' learning outcomes and process skills in plant tissue culture as compared to the traditional learning strategy. Nnorom, and Rita (2017) used guided-inquiry and demonstration approach. Chan and Morales (2016) used customized cognitive fitness classroom approach in enhancing the process skills in science. A research study conducted by Khairani et al.(2021) found out positive correlation between process skills in science and learning model of teaching. Wijayanti et al.(2014) revealed that learning model had a positive effect on basic science process skills. On the contrary, research study conducted by Gok (2014) found out negative correlation between learning instructional model and integrated science process skills. Therefore it necessitated further investigation of the contribution of Science Process Skills to the academic achievement in Physics of students at the secondary level.

4. Statement of the Problem

The review done from the available relevant literature, relating to the present research area, led the investigators to conceptualize the problem in an attempt to fill in the lacunae found.
Thus the problem is stated as here under:
Cyberbehaviour, Science Process Skills and Academic Achievement in Physics among Standard IX Students

5. Objectives of the Study

The objectives of the present study are:
- To prepare a plan of action to teach using Interactive Whiteboard in classrooms;
- To investigate the possible relationship between the independent variables, cyberbehaviour and Science process skills and the dependent variable achievement in Physics;
- To investigate the possible significant difference between the pre and post-test scores of cyberbehaviour and Science process skills among standard IX students in Experimental and Control Groups;
- To investigate the possible significant difference between the pre and post-test scores of achievement test in Physics among standard IX students in Experimental and Control Groups;
- To investigate the possible significant difference between the gain scores of cyberbehaviour, Science process skills among standard IX students in Experimental and Control Groups;and
- To investigate the possible significant difference between the gain scores of achievement test in Physics among standard IX students in Experimental and Control Groups.

5. Hypotheses

- There will be a significant relationship between the independent variables, cyberbehaviour and Science process skills and the dependent variable achievement in Physics;
- There will be no significant difference between the pre and post-test scores of cyberbehaviour and Science process skills among standard IX students in Experimental and Control Groups;
- There will be no significant difference between the pre and post-test scores of achievement test in Physics among standard IX students in Experimental and Control Groups;
- There will be no significant difference between the gain scores of cyberbehaviour, Science process skills among standard IX students in Experimental and Control Groups;and
- There will be no significant difference between the gain scores of achievement test in Physics among standard IX students in Experimental and Control Groups.

7. Method of Investigation

The present study deals with the analyses of pre and post test scores of the experimental and control groups where the intervention is given to the experimental group for a period of 30 days and traditional method of instruction to the controlled group with respect to cyberbehaviour student scale, Science process skills and achievement test of Physics for IX standard students.

7.1Population and Sample Characteristics

The investigator selected Government-aided Girls Higher Secondary School, Chennai district for the experimental study (32 students as experimental group and 32 students as control group). The English medium students of standard IX following the Tamil Nadu state board syllabus were selected. For validation of the tools the investigator selected experts from various field. The experts include teacher educators, science teachers from higher secondary and secondary school teachers, from government, aided and unaided sectors; comprise both male and female experts.

7.2 Tools used for the Study

The variables chosen for the present study necessitated both selection and construction of relevant tools. The tools selected are to be used for assessment of the variables are as follow:

(i) Cyberbehaviour Student Scale (Developed by the Investigator)
(ii) Science Process Skills (Zeidan and Jayosi 2014)
(iii) Achievement Test in Physics

8. Analyses of Data

The result of the analyses of data collected are compiled and presented in tables below:
Statistical analyses will be based on the hypotheses formulated for the present study. It is envisaged to be multivariate statistical analyses as the study includes multiple variables.

Table-1: Analysis of Correlation between the Select Variables among standard IX Students

Variables	Cyberbehaviour	Science Process Skills	Achievement Test in Physics
Cyberbehaviour	1	0.569**	0.720**
Science Process Skills	X	1	0.546**
Academic Achievement in Physics	X	X	1

**Significant at 0.01 level

From the above table (Table-1), it is evident that the select variables of the present study, namely cyberbehaviour, science process skills and academic achievement are positively correlated with each other and significant at 0.01 level.

Table-2: Statistical Analysis of Means of Pre-test Scores of Cyberbehaviour, Science Process Skills and Achievement Test in Physics among Standard IX Students in Experimental and Control Groups

Variables	Groups	Sample Size	Mean	SD	SEM	SED	CR	Level of Significance
Cyberbehaviour	Experimental Group	32	170.09	23.37	4.13	5.64	0.33	0.742^{NS}
	Control Group	32	168.22	25.02	4.42			
Science Process Skills	Experimental Group	32	17.72	6.47	1.14	1.50	0.98	0.333^{NS}
	Control Group	32	16.25	6.63	1.17			
Achievement in Physics	Experimental Group	32	29.03	5.80	1.03	1.18	0.24	0.813^{NS}
	Control Group	32	28.75	3.18	0.56			

NS – Not Significant

On comparing the pre-test scores of the experimental and control groups of standard IX students it is seen that the pre-test scores of the experimental group and control group are found to be not significant in all the three independent variables namely cyberbehaviour and science process skills and the dependent variable, achievement test in physics. The lack of significant difference indicates that both the experimental and control groups had comparable levels of cyberbehavior, science process skills and achievement in physics before the intervention. This is important as it establishes that any changes observed after the intervention can be more confidently attributed to the experimental treatment, not pre-existing differences.

Table-3: Statistical Analysis of Means of Pre and Post-test Scores of Cyberbehaviour, Science Process Skills and Achievement Test in Physics among Standard IX Students in Experimental Group

Variable	Pre and Post Test Scores	Sample Size	Mean	SD	SEM	SED	CR	Level of Significance
Cyberbehaviour	Pre-test	32	170.09	23.37	4.13	4.55	7.09	0.001**
	Post-test	32	202.31	8.26	1.46			
Science Process Skills	Pre-test	32	17.72	6.47	1.14	1.30	3.99	0.001**
	Post-test	32	22.81	4.01	0.71			
Achievement in Physics	Pre-test	32	29.03	5.80	1.03	1.41	3.92	0.001**
	Post-test	32	34.56	5.63	1.00			

****Significant at 0.01 level**

On comparing the pre and post-test scores of the experimental group of standard IX students it is seen that the mean of post-test scores of the experimental group are found to be higher in all the three independent variables namely, cyberbehaviour and science process skills and the dependent variable achievement test in physics than the control group. Therefore there is a significant difference in all the three independent and the dependent variable when considered among the pre and post-test scores of the experimental group. The results indicate that the intervention or treatment provided to the experimental group of standard IX students has had a positive impact. The post-test scores for the experimental group are higher across all three independent variables cyberbehaviour, and science process skills—as well as the dependent variable, achievement in physics, compared to their pre-test scores. This suggests that the intervention improved students', as well as their science process skills, leading to better performance in physics. The significant difference between the pre- and post-test scores highlights the effectiveness of the intervention in enhancing students' learning outcomes.

Table-4 Statistical Analysis of Means of Pre and Post-test Scores of Cyberbehaviour, Science Process Skills and Achievement Test in Physics among Standard IX Students in Control Group

Variable	Pre and Post Test	Sample Size	Mean	SD	SEM	SED	CR	Level of Significance
Cyberbehaviour	Pre-test	32	168.22	25.02	4.42	4.86	4.52	0.001**
	Post-test	32	146.28	9.95	1.76			
Science Process Skills	Pre-test	32	16.25	6.63	1.17	1.36	1.22	0.231NS
	Post-test	32	17.91	2.48	0.44			
Achievement in Physics	Pre-test	32	28.75	3.18	0.56	0.65	1.84	0.076NS
	Post-test	32	27.56	1.92	0.34			

****Significant at 0.01** **NS-Not Significant**

On comparing the pre and post-test scores of the control group of standard IX students it is seen that the mean of pre-test scores of the control group are found to be higher in the independent variables cyberbehaviour and the dependent variable achievement test in physics. But for the third independent variable science process skills the mean of the post-test scores are found to be higher in the control group. Whereas there is a significant difference found in the cyberbehaviour and there is no significant difference between the independent variable science process skills and the dependent variable achievement test in physics among the pre and post-test scores of the control group.This result implies that for variable like behavior, intervention might be needed to maintain or enhance positive outcomes, while natural learning progression can slightly improve skills like science process skills, though more focused efforts may be required for significant improvement.

Table-5 :Statistical Analysis of Means of Post - test Scores of Cyberbehaviour, Science Process Skills and Achievement Test in Physics among Standard IX Students in Experimental and Control Groups

Variable	Groups	Sample Size	Mean	SD	SEM	SED	CR	Level of Significance
Cyberbehaviour	Experimental Group	32	202.31	8.26	1.46	2.16	25.97	0.001**
	Control Group	32	146.28	9.95	1.76			
Science Process Skills	Experimental Group	32	22.81	4.01	0.71	0.80	6.15	0.001**
	Control Group	32	17.91	2.48	0.49			
Achievement in Physics	Experimental Group	32	34.56	5.63	1.00	0.99	7.10	0.001**
	Control Group	32	27.56	1.92	0.34			

****Significant at 0.01 level**

On comparing the post-test scores of the experimental and control group of standard IX students it is seen that the mean of post-test scores of the experimental and control groups are found to be higher in the independent variables cyberbehaviour, science process skills and the dependent variable achievement test in physics. It is also found that all the independent and dependent variables are found to be significant at 0.01 level. The intervention applied to the experimental group had a positive and significant effect on the students' cyberbehavior, science process skills and their achievement in physics. The control group also showed improvements, the differences between the two groups were significant, emphasizing the effectiveness of the intervention.

Table – 6 Statistical Analysis of Means of Gain Scores of Cyberbehaviour, Science Process Skills and Achievement Test in Physics among Standard IX Students in Experimental and Control Groups

Variable	Groups	Sample Size	Mean	SD	SEM	SED	CR	Level of Significance
Cyber behaviour	Experimental Group	32	32.22	25.72	4.55	6.23	8.70	0.001**
	Control Group	32	21.94	27.47	4.86			
Science Process Skills	Experimental Group	32	5.09	7.35	1.30	1.87	1.84	0.075NS
	Control Group	32	1.66	7.67	1.36			
Achievement in Physics	Experimental Group	32	5.53	7.98	1.41	1.53	4.4	0.001**
	Control Group	32	1.19	3.66	0.65			

SD - Standard Deviation **SEM – Standard Error of Mean**
SED – Standard Error of Difference **CR – Critical Ratio**
****Significant at 0.01 level**

On comparing the gain scores of independent variables namely cyberbehaviour, science process skills and the dependent variable achievement test in physics it is seen that the mean scores of experimental group are found to be higher when compared to the mean score of control group. There is a significant difference found between the independent variable cyberbehaviour and the dependent variable achievement test in physics but for the independent variable science process skills it is found to be not significant. The experimental group showed higher achievement test in physics compared to the control group, indicating that the intervention was effective. Specifically, cyberbehavior is found to have a significant positive impact on achievement test in physics, suggesting that these factors are crucial in enhancing student performance in this subject. However, science process skills did not significantly contribute to the difference in achievement, indicating that its role in influencing physics achievement is limited in this context. This highlights the importance of integrating cyberbehaviors in educational strategies to improve students outcome in physics.

9. Discussion

Mundilarto and Ismoyo (2017) studied physics achievement and critical thinking of students when taught with problem-based learning approach. The research included quasi experimental pretest-posttest control design . The sample was drawn from senior high school in Indonesia. Data analysis was done using MANOVA. The results revealed that experimental group students perform better in achievement and critical thinking than control group students. In the present investigation, investigating the intervention of interactive whiteboard in classrooms in developing cyberbehaviour, science process skills and achievement test in physics it is found that there is no significant difference in the pre-test scores of students in both groups experimental and control groups.

After exposing the standard IX students in the experimental group to teaching of physics using interactive whiteboard, the students were again tested with the same cyberbehaviour, science process skills and achievement test and the post-test scores were coded systematically. The standard IX students in the control group were exposed to the regular traditional teaching method. Finally the students were again tested with the same cyberbehaviour, science process skills and achievement test in physics tools and the data served as post-test score.

The interpretation that the pre-test scores of the experimental group and control group are found to be not significant in the independent variables (cyberbehaviour, and science process skills) and the dependent variable (achievement test in physics) suggests that both groups started from a similar baseline before any intervention or experimental treatment were applied. It is here are some reasons and explanations to support this interpretation:

- **Initial Equivalence of Groups:** The lack of significant difference indicates that both the experimental and control groups had comparable levels of knowledge, skills and behaviors related to cyber, science process skills, and achievement in physics before the experiment. This is important as it establishes that any changes observed after the experiment can be more confidently attributed to the experimental treatment, not pre-existing differences.
- **Validity of the Intervention:** When the pre-test scores are not significantly different, it helps validate the experimental design, suggesting that random assignment or other matching techniques were effective in creating equivalent groups. This strengthens the internal validity of the study.
- **Fair Comparison:** If both groups were starting at different levels (i.e., with significant differences), it would be difficult to determine if the intervention was truly responsible for any post-test differences. Similar pre-test scores allow for a fair comparison of the impact of the treatment.
- **Controlling for Confounding Variables:** By showing that there were no significant pre-test differences in the three independent variables and the dependent variable, it suggests that potential confounding factors that might affect the outcome such as prior knowledge or experience with cyberbehavior or science skills were equally distributed across both groups.

When comparing the pre and post-test of the experimental group of standard IX students, the results indicate that the intervention or treatment provided to the experimental group of standard IX students has had a positive impact. The post-test scores for the experimental group are higher across all three independent variables cyberbehaviour, and science process skills as well as the dependent variable, achievement in physics, compared to their pre-test scores. This suggests that the intervention improved students' behaviors, and skills as well as their science process skills, leading to better performance in physics. The significant difference between the pre- and post-test scores highlights the effectiveness of the intervention in enhancing students' learning outcomes.

When comparing the pre and post-test scores of the control group of standard IX students the pre-test mean scores for the control group are higher than the post-test scores, indicating that, initially, the students in the control group had a better cyberbehaviour. The significant difference between the pre-test and post-test

scores suggests that there was a decline in the students' cyberbehaviour from pre to post-test. This may imply that, without intervention or guidance, their responsible cyberbehaviour weakened over time.

The post-test mean scores for science process skills are higher in the control group, indicating an improvement in this area over time, even though they were not part of any special intervention. This improvement may be attributed to the natural progression of learning or other educational experiences. However, there is no significant difference between pre-test and post-test scores, which suggests that the change in science process skills was not large enough to be statistically meaningful, or that any improvement was due to chance.

The mean pre-test scores for the achievement test in physics are higher, but there is no significant difference between the pre-test and post-test scores, indicating that students' performance in physics did not change notably over time without intervention. This suggests that without specific educational interventions or changes in teaching strategies, the control group maintained a consistent level of performance in physics.

The post-test scores of the experimental group and the control group of standard IX students were compared on various variables, including, cyberbehavior, science process skills (independent variables), and achievement test in physics (dependent variable). The mean scores of both the experimental and control groups were higher on all independent and dependent variables after the intervention or treatment, indicating an improvement in these areas for both groups. The results showed a statistically significant difference between the groups for all variables at the 0.01 level. This means there is a high probability (99%) that the observed differences in post-test scores between the experimental and control groups are not due to random chance. The intervention or treatment likely had a meaningful impact on the outcomes.

The students in the control group showed a decline in cyberbehaviour, while their science process skills slightly improved, but the change was not statistically significant. Their achievement in physics remained consistent with no significant gains or losses. This result implies that for variable cyberbehavior, intervention might be needed to maintain or enhance positive outcomes, while natural learning progression can slightly improve skills like science process skills, though more focused efforts may be required for significant improvement. The intervention or teaching method applied to the experimental group using the interactive whiteboard had a positive and significant effect on the students' cyberbehavior, science process skills and their achievement in physics. The control group also showed improvements, but the differences between the two groups were significant, emphasizing the effectiveness of the intervention

Educational reform calls for a shift away from organizing instruction around time devoted to lecture or practicing discrete skills in specific academic disciplines toward an emphasis on engaging students in long-term, meaningful projects. Technology can enhance student acquisition through drill and practice. From the beginning of the computer age, educational researchers and practitioners have told us that for technology use to be successful in our schools it needed to be closely tied to school reform. The impact of technology on student learning is growing rapidly. The integration of technology within education increases student stimulation and comprehensive interaction while enabling a differentiation in teaching methodologies.

The evolution of education requires technology integration with new pedagogical approaches with psychological attributes. The movement from traditional learning styles to a newer progression of interrelated teaching methodologies is progressively changing the face of education. Today, education is much more than drill and development of basic skills. Students growth in acquisition and complex reasoning is a driving force to enable academic enhancement. Technology can assist with some of these expectations and make teachers and their students more successful.

According to Demesa (2009), further research studies are needed, emerging trends indicate that, under the right conditions, technology: accelerates, enriches, and deepens basic skills; motivates and engages students in learning; helps relate academics to the practices of today's workforce; increases economic viability of tomorrow's workers; strengthens teaching; contributes to change in schools; Connects schools to the world. Both academically and professionally, society has become dependent on technology. As technological development progresses, education must make adjustments to remain current. Instruction, assessment, and teaching abilities must adapt to technology, influencing a positive change in academic progression.

In the present investigation it is found that the gain scores of cyberbehaviour and achievement test in physics of students in experimental group are found to be significantly better than the gain scores of students in control group. This is because of the exposure of the students to teaching using interactive whiteboard in classrooms, which the students in control group have been deprived of. The experimental group performed better than the control group, as indicated by higher mean scores across all variables, suggesting that the intervention or treatment applied to the experimental group positively influenced their outcomes.

A significant difference was found between the independent variable cyberbehavior, and the dependent variable achievement test in physics, which suggests that students with a more positive cyberbehavior had better performance in the achievement test. This implies that these factors play a crucial role in students' physics achievement. However, for the independent variable science process skills, the difference was not significant, indicating that the science process skills did not have a notable effect on the students' performance in the physics achievement test. This suggests that other factor cyberbehavior, had a stronger influence in this context, while science process skills did not significantly contribute to the difference in test scores.

10. Conclusion

The study underscores the necessity of improving the quality of Science subject by leveraging modern tools such as interactive whiteboard and focusing on pedagogical approaches that foster positive student behaviour. The independent variable cyberbehavior, and science process skills play a critical role in shaping students' learning experiences and outcomes.

In this context, the interactive whiteboard serves as a catalyst for engagement, allowing students to interact with content visually and kinesthetically. This interaction not only aids comprehension but also makes learning more dynamic, improving their overall knowledge in Physics. Appropriate cyber behavior, including responsible use of technology and digital tools, is crucial for maintaining focus and achieving better learning outcomes. When students engage in constructive cyberbehavior, such as actively participating in digital learning environments, they are more likely to experience enhanced cognitive development and better academic performance.Science Process Skills: These skills—such as observing, classifying, inferring, predicting, and experimenting—are fundamental in the concept of Physics. By nurturing science process skills through interactive technologies like interactive whiteboard, students develop critical thinking and problem-solving abilities. This empowers them to tackle complex concepts and grasp scientific laws more effectively. The achievement test in Physics highlights how interactive teaching methods can significantly improve student performance. When interactive whiteboard are used in classrooms, they facilitate a deeper understanding of abstract concepts by providing visual aids, simulations and interactive demonstrative activities. This helps students retain information better, leading to higher scores in achievement tests.

In conclusion, the study reveals that incorporating technology in education, supported by a positive, responsible cyberbehavior and the development of science process skills, can greatly enhance student achievement in physics. Interactive whiteboard, as a modern educational tool, should be more widely adopted in schools to not only improve academic performance but also to foster a more positive learning environment. This holistic approach is essential for the country's educational development and the overall empowerment of students. The ultimate goal is to cultivate a generation that is well-equipped with a erudite knowledge in physics, critical thinking and scientific literacy, which are essential for national progress and technological innovation.

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