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Critical Analysis of the Application of Physics in the Daily Life of Intermediate Learners in Pakistan

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Abstract: Physics, being the basis of everything in the universe, is highly valued in Pakistan. It is compulsory for further education in medical, engineering and other scientific subjects. It has absolutely wide application in the daily life. In order to find the application of physics in the daily life of students, a survey was made on a sample of three hundred students and thirty teachers that were selected through random stratified sampling from access population. The data were collected through questionnaire and a test representing the application of physics. It was found that there was no significant application of physics in the daily life of students. The students' performance in the test was extremely poor. The teachers and students were unaware of the objectives, standards and benchmarks of physics as were set by the curriculum developers. The syllabus was satisfactory but due to being in English, it was very difficult for teachers and students to understand the concepts of physics properly and apply those concepts in the daily life. The creativity, scientific and logical thinking was missing over there. There was misunderstanding between teachers and students regarding the competency of physics teachers and attitude of students towards physics. There was no use of latest teaching methods and A.V. aids in the classroom teaching learning. The focus was given on theoretical teaching learning of physics, while the practical aspects of physics were ignored. The teachers and students tried to promote cramming, rote learning and memorization of physics concepts, rather than rational and logical understanding and application of physics concepts.

Keyword: Application of physics, understanding of concepts, syllabus, competency of teachers and attitude of students .

1. INTRODUCTION

Originally the word 'physics' has Greek 'origin. It is taken from the Greek word "physis" means "nature". It studies the behaviour, properties and changes in the matter and energy and their relationship and interaction (Harman, 2007).

Physics, being the branch of natural science, deals with interaction, bonding and relationship of matter and energy – the fundamentals of universe. The entire universe seems to be meaningless without matter and energy. There is wide range of universal laws and theories in physics which lead the researchers for further understanding the universe and making the maximum use of universe in the best interest of mankind. These theories and laws are not only valid, reliable and accepted universally but they have also laid the foundation of modern inventions and discoveries.

The application of physics can be observed in different fields like industry, economics, transportation, medical, engineering and such other technical fields. Harman (2007) describes that growth, development and application of modern technologies is impossible without the application of physics. It has made the world a global village. All the means of communication are the miracles of physics. Besides, travelling of many kilometers in a very short time, flying in the sky like birds, living in a comfortable buildings and treatment of fatal diseases etc are impossible without the application of physics.

However, realizing the need and importance of physics, government of Pakistan has made the teaching learning of physics compulsory for the intermediate students enrolled in computer, Pre-Medial and Pre-Engineering. National Curriculum for Physics Grades XI– XII (2006) encompasses that "the syllabus of 'Physics' is designed to emphasize less on purely factual material, but a much greater emphasis on the understanding and application of physics concepts and principles" (p. 6). Soomro, Qaisrani and Uqaili (2011) affirm that "physics is measured as the most problematic area within the field of science. Teaching of physics magnetizes fewer learners than other field of science subjects 'and' seems as a difficult course for students from secondary school to university" (p. 2282).

Now the question rises, whether the knowledge, skills and experiences regarding physics is properly transferred from teachers to students or not. Additionally, the concepts of physics acquired by intermediate students have the practical application in their daily life or not. Considering the above raised questions a survey regarding the application of physics in the daily life of students has been conducted.

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Research questions

RQ1. To what extent does the knowledge of physics concepts have an application in the daily life of students?

RQ2.To what extent is the content of physics effective to enhance application of physics in the daily life of students?

RQ3.To what extent is the competency of teachers effective to enhance application of physics in the daily life of students?

RQ4.To what extent is the attitude of students helpful to enhance application of physics in the daily life of students?

RQ5. What is the difference in the perceptions between teachers and students regarding the application of physics in their daily life of students?

Major Hypothesis

Ho1. There is no significant relation between knowledge of physics concepts and its application in the daily life of students.

Ho2.There is no significant impact of the physics syllabus on the application of physics in the daily life of students.

Ho3.There is no significant impact of the competency of teachers on the application of physics in the daily life of students.

Ho4.There is no significant impact of the attitude of students on the application of physics in their daily life.

Sub-Hypothesis

Ho5.There is no significant difference between teachers and students regarding the application of physics in their daily life.

Ho6.There is no significant difference between teachers and students regarding students' knowledge of physics concepts.

Ho7.There is no significant difference between teachers and students regarding the syllabus of physics.

Ho8.There is no significant difference between teachers and students regarding the competency of teachers.

Ho9. There is no significant difference between teachers and students regarding the attitude of students towards physics.

Ho10. There is no significant difference between male and female students regarding the application of physics in their daily life.

Ho11. There is no significant difference between rural and urban area students regarding the application of physics in their daily life.

Ho12. There is no significant difference between XI class and XII class students regarding the application of physics in their daily life.

Review of literature

Since the creation of Pakistan, more emphasis has been given on scientific teaching learning. In this regard scientific learning outcomes especially "recalling, understanding, applying, analyzing, evaluating, and creating" have been given prominent position in the syllabus of physics (National Curriculum for Physics Grades XI–XII, 2006). Despite of huge expenses in this field, the performance of students in science especially in physics is not up to mark. Safdar (2013) in a research found that physics is taught in Pakistan through lecture method, in which students are asked to write the notices and memorize the written material to pass the examination. This shows that transfer of knowledge from teachers to students takes place through rote learning (memorization) and soon after the examination students mostly forget the memorized material. The construction of knowledge through understanding is fully ignored in Pakistan. Arif (2003) describes that teachers in Pakistan do not use modern and latest teaching methods that promote critical thinking. Adding to this Rashid (2005) points out that laboratories teaching of physics is not common in Pakistan due to inadequate provision of laboratory material over there. As a result, most of the teaching learning of physics takes place through lecture method.

Many experiments have been made in this regard and curriculum has undergone certain changes throughout the history of Pakistan to address such issues, yet the creation of scientific understanding of natural phenomena and laws among the youth of Pakistan have not taken place. The students enrolled in physics are not in position to focus and find the answers of the questions like 'why does it happen, how does it happen, what will be, if it does not happen etc'. They are not capable to use the laws and theories of physics to get the solution of their practical problems.

Nevertheless, the government is exerting all the energy towards the development of plans and policies but the implementation of plans and policies has never been emphasized properly. Furthermore, modification and creation of high quality scientific curriculum has been given top priority from time to time but practical implementation of curriculum has never been ensured. The teachers teaching scientific subjects in Pakistan are not capable to fully understand the practical aspects of science. In such cases of teachers' incompetency, how can the misunderstood concepts of science be taught to students?

Consequently, the students, rather than taking interest in learning science, develop negative attitude

towards learning scientific subjects. They often pay less attention and try their level best to avoid attending the scientific subjects especially physics.

2. METHODOLOGY

The methodology adapted in this research is survey-mixed design. Gray (2004) affirms that survey is being widely used in every research now-a-days. Creswell (2008) adds that in education majority of researchers are vigorously using survey. Neuman (2007) believes that survey is more reliable due to its accuracy. It presents absolute measurement of the population. In this survey study, the data were collected from a sample of three hundred students and thirty teachers that were selected from access population delimited to Hyderabad through random stratified technique. A questionnaire, comprising 70 closed ended items and a test comprising 100 multiple choice questions regarding the application of physics in the daily life of students, was developed for the data collection. SPSS-22 was used for the statistical analysis of data. Regression and t-test was used for testing hypothesis where as for item analysis percentage (%) was used. The reliability of the instruments was checked with the help of six experts and pilot testing. The reliability of the instruments was found 0.994 using Chronbach's Alpha on SPSS.

Findings

Table: 1. Item analysis of questionnaire of students and teachers

S	Item (Students n= 300 & Teachers n= 30)		SD (%)	D (%)	UN (%)	A (%)	SA (%)
Knowledge regarding objectives, standards and benchmarks of physics							
1.	Teachers know the aims and objectives of teaching physics prescribed by policy makers.	Students	62	20	2.3	12.3	3.3
		Teachers	46.7	30.0	6.7	3.3	13.3
2.	Students know the aims and objectives of learning physics prescribed by policy makers.	Students	60	22.3	2.3	11.7	3.7
		Teachers	53.3	26.7	3.3	13.3	3.3
3.	Teachers know the standards of teaching physics prescribed by policy makers.	Students	63.3	19.7	1.3	11.7	4
		Teachers	56.7	20.0	3.3	6.7	13. 3
4.	Students know the standards of learning physics prescribed by policy makers.	Students	57.7	25.3	1.3	11.3	4.3
		Teachers	56.7	23.3	3.3	13.3	3.3
5.	Teachers know the benchmarks of teaching physics prescribed by policy makers.	Students	59.7	23.3	2.7	10	4.3
		Teachers	56.7	20	6.7	10	6.7
6.	Students know the benchmarks of teaching physics prescribed by policy makers.	Students	63.3	21	1.3	11.7	2.7
		Teachers	56.7	20	6.7	13.3	3.3
Physics syllabus							
7.	Physics syllabus enhances the application of physics concepts in the daily life of students	Students	7.3	20	4.3	14.7	53.7
		Teachers	10	10	3.3	46.7	30
8.	Physics syllabus is useful in real life situation.	Students	9	18	4	16.3	52.7
		Teachers	16.7	13.3	13.3	26.7	30
9.	Physics syllabus created scientific attitude of students	Students	9.7	17	4	17.7	51.7
		Teachers	20.0	16.7	10.0	30.0	23.3
10.	Physics syllabus promotes logical and rational thinking.	Students	7.3	19	3.7	19.3	50.7
		Teachers	10.0	26.7	3.3	36.7	23.3
11.	Physics syllabus develops reasoning and effective communication.	Students	7	19.7	4	19.3	50
		Teachers	20.0	16.7	6.7	33.3	23.3
12.	Physics syllabus enhances the technical skills of students.	Students	9	18.7	3.7	15	53.7
		Teachers	20.0	13.3	3.3	40.0	23.3
13.	Physics syllabus promotes problem solving activities.	Students	9.7	17.7	1.7	16	55
		Teachers	26.7	6.7	6.7	36.7	23.3
14.	Physics syllabus presents the daily life examples of students with respect to their local society.	Students	9	17.3	2.3	15.7	55.7
		Teachers	26.7	10.0	3.3	30.0	30.0
15.	Physics syllabus, being in English, is very difficult for students to understand the concepts properly.	Students	9.7	17.7	0.3	19.7	52.7
		Teachers	10.0	26.7	3.3	26.7	33.3
Competency of physics teachers							
16.	Physics teachers are competent to enable the students to apply the concepts of physics in their daily life.	Students	53.3	35.3	1	8.7	1.7
		Teachers	10.0	13.3	10.0	20.0	46.7
17.	Physics teachers are competent to make the students understand the concepts of physics properly.	Students	57	31.7	0.3	7.7	3.3
		Teachers	10.0	26.7	6.7	16.7	40.0
18.	Physics teachers use modern and latest teaching methods for teaching physics.	Students	58.3	30.3	2	5	4.3
		Teachers	10.0	20.0	3.3	13.3	53.3
19.	Physics teachers often use A.V aids during teaching learning.	Students	56.3	32.3	1.3	9	1
		Teachers	10.0	16.7	6.7	33.3	33.3
20.	Students are satisfied with content knowledge of teachers.	Students	55	33.7	2.7	7.7	1
		Teachers	13.3	23.3	10	20.0	33.3
21.	Students are satisfied with pedagogical skills of teachers.	Students	53.3	35.3	2	5	4.3
		Teachers	3.3	36.7	6.7	10.0	43.3

22.	Students are satisfied with classroom management skills of teachers.	Students	55.7	33	0.3	6	5
		Teachers	3.3	23.3	16.7	13.3	43.3
23.	Students are satisfied with interaction and communication skills of teachers.	Students	57.7	31	1.3	3.7	6.3
		Teachers	00	26.7	6.7	13.3	53.3
24.	Physics teachers often present students' daily life examples while teaching physics.	Students	54	34.7	2.7	4.3	4.3
		Teachers	6.7	16.7	10.0	20.0	46.7
25.	Physics teachers often focus more on practical application of physics than teaching only concepts.	Students	53.3	35.3	3.3	0.3	7.7
		Teachers	3.3	20	3.3	26.7	46.7
Attitude of students towards physics							
26.	Students are fond to apply the concepts of physics in their daily life.	Students	25.7	00	2.7	60.3	11.3
		Teachers	43.3	13.3	6.7	30	6.7
27.	Students often ask questions from teachers regarding application of physics in their daily life.	Students	20	4	2.3	61.3	12.3
		Teachers	30	30	6.7	16.7	16.7
28.	Students take interest in learning the concepts of physics.	Students	21	5.3	0.7	56.3	16.7
		Teachers	36.7	30	3.3	26.7	3.3
29.	Students attend the physics class regularly and punctually.	Students	21.3	3.7	2	61.3	11.7
		Teachers	40	23.3	3.3	13.3	20
30.	Students often participate in classroom discussion.	Students	22	4	1.7	58.7	13.7
		Teachers	36.7	30	3.3	16.7	13.3
31.	Students often ask empirical questions from teachers.	Students	22.3	39.7	2	28	8
		Teachers	33.3	30	6.7	20	10
32.	Students often consider physics more difficult than other subjects.	Students	18.7	11.7	3.3	61.3	5
		Teachers	13.3	6.7	3.3	20	56.7
Understanding the concepts of physics							
33.	Students properly understand the concepts of physics.	Students	20.3	9.7	2.3	62.7	5
		Teachers	6.7	23.3	6.7	50	13.3
34.	Students properly understand the concepts of measurement.	Students	21.7	7.7	3.7	62	5
		Teachers	13.3	16.7	10	50	10
35.	Students properly understand the concepts of scalars and vectors.	Students	19.7	9.3	4.3	61.7	5
		Teachers	16.7	13.3	16.7	36.7	16.7
36.	Students properly understand the concepts of equilibrium.	Students	24.3	5.3	2.7	62.7	5
		Teachers	20	10	13.3	36.7	20
37.	Students properly understand the concepts of force.	Students	20.7	9.3	2	63	5
		Teachers	6.7	30	3.3	50	10
38.	Students properly understand the concepts of motion.	Students	19	10	2.7	62.3	6
		Teachers	6.7	23.3	6.7	40	23.3
39.	Students properly understand the concepts of work.	Students	25.3	4.3	2	61.7	6.7
		Teachers	13.3	13.3	10	46.7	16.7
40.	Students properly understand the concepts of energy.	Students	21	8.7	0.3	66	4
		Teachers	13.3	23.3	3.3	40	20
41.	Students properly understand the concepts of fluid dynamics.	Students	22.3	6.3	1.3	66.7	3.3
		Teachers	16.7	16.7	6.7	50	10
42.	Students properly understand the concepts of oscillation.	Students	20	9	2.7	63.3	5
		Teachers	16.7	10	10	56.7	6.77
43.	Students properly understand the concepts of waves.	Students	18.7	10.7	2.3	62.7	5.7
		Teachers	13.3	23.3	6.7	26.7	30
44.	Students properly understand the concepts of physical optics.	Students	25	4.7	2.3	61	7
		Teachers	13.3	16.7	6.7	30.0	33.3
45.	Students properly understand the concepts of thermodynamics.	Students	21.7	8	1.3	63	6
		Teachers	20.0	13.3	3.3	46.7	16.7
46.	Students properly understand the concepts of electrostatics.	Students	23.3	5.3	2.7	65.3	3.3
		Teachers	16.7	13.3	6.7	43.3	20.0
47.	Students properly understand the concepts of current electricity.	Students	20.3	9.3	2	65.3	3
		Teachers	3.3	26.7	6.7	40.0	23.3
48.	Students properly understand the concepts of electromagnetism.	Students	22	8	2	63	5
		Teachers	13.3	13.3	10.0	50.0	13.3
49.	Students properly understand the concepts of electronics.	Students	23.3	7.3	0.7	65	3.7
		Teachers	6.7	26.7	3.3	46.7	16.7
50.	Students properly understand the concepts of atomic Spectra.	Students	24.7	4.3	2.3	64	4.7
		Teachers	16.7	13.3	6.7	40.0	23.3
51.	Students properly understand the concepts of nuclear Physics.	Students	18.7	11	2	65	3.3
		Teachers	10.0	23.3	3.3	46.7	16.7
Application of physics in daily life of students							
52.	Students are capable to apply the concepts of physics in their daily life.	Students	69	2.7	2.3	4.3	21.7
		Teachers	46.7	10.0	6.7	23.3	13.3
53.	Students can apply the concepts of measurement in their daily life.	Students	67	5	1.3	4	22.7

		Teachers	46.7	6.7	6.7	26.7	13.3
54.	Students can apply the concepts of scalars and vectors in their daily life.	Students	66	6.7	1.7	5	20.7
		Teachers	46.7	6.7	10.0	30.0	6.7
55.	Students can apply the concepts of equilibrium in their daily life.	Students	71	0.3	1.7	7.3	19.7
		Teachers	46.7	13.3	3.3	23.3	13.3
56.	Students can apply the concepts of force in their daily life.	Students	69.3	3	2	4	21.7
		Teachers	46.7	6.7	3.3	30.0	13.3
57.	Students can apply the concepts of motion in their daily life.	Students	67.7	5	1.3	6.3	19.7
		Teachers	46.7	10.0	3.3	26.7	13.3
58.	Students can apply the concepts of work in their daily life.	Students	70	2.7	1	5	21.3
		Teachers	46.7	20.0	3.3	16.7	13.3
59.	Students can apply the concepts of energy in their daily life.	Students	64.3	8	1	4.7	22
		Teachers	46.7	20.0	3.3	16.7	13.3
60.	Students can apply the concepts of fluid dynamics in their daily life.	Students	62	10	2.7	4.3	21
		Teachers	46.7	26.7	6.7	10.0	10.0
61.	Students can apply the concepts of oscillation in their daily life.	Students	64.3	8.3	5	00	22.3
		Teachers	46.7	33.3	6.7	3.3	10.0
62.	Students can apply the concepts of waves in their daily life.	Students	66.7	5	2.7	6	19.7
		Teachers	46.7	33.3	3.3	6.7	10.0
63.	Students can apply the concepts of physical optics in their daily life.	Students	59.3	13	5.3	00	22.3
		Teachers	46.7	26.7	6.7	6.7	13.3
64.	Students can apply the concepts of thermodynamics in their daily life.	Students	53.3	18.3	1.3	7.3	19.7
		Teachers	46.7	26.7	10.0	3.3	13.3
65.	Students can apply the concepts of electrostatics in their daily life.	Students	55	19.3	1.7	5.7	18.3
		Teachers	46.7	23.3	6.7	10.0	13.3
66.	Students can apply the concepts of current electricity in their daily life.	Students	66.7	4.7	2.3	7.7	18.7
		Teachers	46.7	20.0	10.0	20.0	3.3
67.	Students can apply the concepts of electromagnetism in their daily life.	Students	67.7	9	2.7	3	17.7
		Teachers	46.7	36.7	3.3	10.0	3.3
68.	Students can apply the concepts of electronics in their daily life.	Students	63.3	8	3.3	8	17.3
		Teachers	50.0	23.3	6.7	13.3	6.7
69.	Students can apply the concepts of atomic spectra in their daily life.	Students	69	5	4	5	17
		Teachers	46.7	33.3	6.7	6.7	6.7
70.	Students can apply the concepts of nuclear physics in their daily life.	Students	69.3	7.7	1.7	5.3	16
		Teachers	60.0	20.0	3.3	6.7	10.0
SD=Strongly Disagree D=Disagree UN=Undecided A=Agree SA=Strongly Agree							

3. ANALYSIS AND DISCUSSION

The above table shows that majority of respondents (both teachers and students) were unaware of the objectives, standards and benchmarks of physics that were set by the curriculum developers. However, they appreciated the syllabus of physics. To them, physics syllabus was very effective to enhance the application of physics concepts in the daily life of students, create scientific attitude of students, promote logical and rational thinking, enhance the technical skills of students, develop reasoning effective communication and promote problem solving activities. They further affirmed that syllabus of physics was not only useful in real life situation but also presented the daily life examples of students with respect to their local society.

At the same time, they also pointed out that physics syllabus, being in English, was very difficult for students to understand its concepts properly. Due to English medium, it was very difficult for students to comprehend the syllabus properly. English medium of physics is proved to be a great challenge for students intermediate students.

The respondents were found divided on the variable "competency of physics teachers". There were contradictory views of both teachers and students in this regard. The students were not satisfied with the teachers' competency but teachers showed their full satisfaction in this regard. The students believed that physics teachers were not competent to enable the students to apply the concepts of physics in their daily life. They further affirmed that Physics teachers were not competent to make the students understand the concepts of physics properly. The teachers did not use modern and latest teaching methods and A. V. aid for teaching physics. Moreover, the students were not satisfied with content knowledge, pedagogical skills, classroom management skills and interaction/ communication skills of teachers. To them, teachers used to focus only on concepts of physics from theoretical aspects, but there was no focus on creativity, logical thinking, rational discussion and practical application of physics. The physics teachers, rather than to present the daily life examples emphasized only on exercises of physics book.

However, physics teacher did not agree with students. To them, teachers were very competent, skilled and experienced. They were fully equipped with content knowledge, pedagogical skills, classroom management skills and communication skills. They taught students according to schedule and requirement of the course. They had to complete the course within prescribed time and schedule, therefore they had to focus more on exercises, so that students may secure good marks and perform better in the examination.

Similarly, the respondents (both teachers and students) were divided on the variable "students' attitude towards physics". Teachers believed that students had negative attitude towards physics but students did not agree with teachers in this regard. Teachers affirmed that students were not interested in learning physics. Moreover, the students were not fond to apply the concepts of physics in their daily life. Rather than to discuss and ask from teacher about the application of physics in their daily life, the students preferred to have rote learning in order to pass the examination with flying colors. However, disagreeing with teachers, students believed that most of the students had positive attitude towards physics, but due to English medium of physics, lack of motivation and incompetency of teachers, it was very difficult for students to understand the concepts of physics properly. They further affirmed that students were regular and punctual in physics period and used take keen interest in learning the concepts of physics. Students not only used to participate in the classroom discussion but also used to ask empirical questions from teachers.

Nevertheless, both teachers and students mutually agreed that students often considered physics more difficult than other subjects but at the same time the students were capable to understand the concepts of physics. They further confirmed that majority of students have fully command over the concepts of physics including the concepts of measurement, scalars and vectors, equilibrium, force, motion, work, energy, fluid dynamics, oscillation, waves, physical optics, thermodynamics, electrostatics, current electricity, electromagnetism, electronics, atomic spectra and nuclear physics. At the same time, they also assured that majority of students were not capable to apply these concepts in their daily life.

To sum up, students' inability to apply the concepts of physics in daily life as is affirmed by both teachers and students, makes it clear that teaching learning of physics regarding the application of physics in the daily of students was not effective. There was no creativity and logical thinking. There was only rote learning and memorization of physics concepts only to pass examination. The practical aspect of physics was found totally missing in the teaching learning of physics.

Testing of hypotheses

Table: 2. Hypotheses testing (Major)

		R	R^2	Sig	F	sig	t	Sig
Ho1.	Students	.687	.472	.00	266.886	.00	16.337	.00
	Teachers	.782[a]	.611	.00	44.016	.00	6.634	.000
Ho2.	Students	.730	.534	.00	340.950	.00	18.465	.00
	Teachers	.882[a]	.779	.00	98.463	.00	9.923	.000
Ho3.	Students	.706[a]	.498	.00	295.820	.00	17.199	.00
	Teachers	.804[a]	.647	.00	51.265	.00	7.160	.00
Ho4.	Students	.697[a]	.485	.00	281.153	.00	16.768	.00
	Teachers	.869[a]	.756	.00	86.555	.00	9.304	.00

Analysis of major hypotheses

- Ho1: The result of first hypothesis is significant. Hence Ho1 is rejected and it is concluded that two variables - the knowledge of physics concepts and the application of physics concepts in the daily life of students are strongly correlated ($p=.00\leq0.05$, R=.678 Students & R=.782teacher).
- Ho2: The result of second hypothesis is significant. Hence Ho2 is rejected and it is concluded that two variables - the physics syllabus and the application of physics in the daily life of students are very strongly correlated ($p=.00\leq0.05$, R=.730 Students & R=.882[a] teachers).
- Ho3: The result of third hypothesis is significant. Hence Ho3 is rejected and it is concluded that two variables - the competency of teachers and the application of physics in the daily life of students are very strongly correlated ($p=.00\leq0.05$, R= .706 Students & R.804 teachers).
- Ho4: The result of fourth hypothesis is significant. Hence Ho4 is rejected and it is concluded that two variables - the attitude of students and the application of physics in the daily life of students are very strongly correlated ($p=.00\leq0.05$, R=.697 Students & .869 teachers).

Table: 3. Sub-hypotheses

		N	Mean	St. Deviation	t	df	Sig.
Ho5.	Students	300	1.990	1.597	-.58	328	.560
	Teachers	30	2.167	1.422			
Ho6.	Students	300	3.228	1.277	-.64	328	.525
	Teachers	30	3.383	1.236			
Ho7.	Students	300	3.877	1.431	.96	328	.340
	Teachers	30	3.617	1.317			
Ho8.	Students	300	1.718	1.0288	-10.58	328	.000
	Teachers	30	3.867	1.345			
Ho9.	Students	300	3.270	1.321	.21	328	.833
	Teachers	30	3.217	1.349			
Ho10.	Students (male)	174	30.43	12.11	-9.87	298	.000
	Students (Female)	126	43.05	9.053			
Ho11.	Rural students	178	30.61	11.551	9.78	298	.000
	Urban students	122	43.20	10.018			
Ho12.	XI class students	161	29.02	10.055	-12.15	298	.000
	XII class students	139	43.50	10.572			

Analysis of sub-hypotheses

- Ho5. The result of fifth hypothesis is insignificant (p=.560≥0.05, t= -.583). Hence Hull hypothesis is accepted and it is concluded that there is no significant difference between teachers and students regarding the application of physics in their daily life.
- Ho6. The result of sixth hypothesis is insignificant (p=.525≥0.05, t= -.636). Hence Hull hypothesis is accepted and it is concluded that there is no significant difference between teachers and students regarding students' knowledge of physics concepts.
- Ho7. The result of seventh hypothesis is insignificant (p=.340≥0.05, t=.956). Hence Hull hypothesis is accepted and it is concluded that there is no significant difference between teachers and students regarding the syllabus of physics.
- Ho8. The result of eighth hypothesis is significant (p.000≤0.05, t= -.583). Hence Hull hypothesis is rejected and it is concluded that there is significant difference between teachers and students regarding the competency of teachers.
- Ho9. The result of ninth hypothesis is insignificant (p=.833≥0.05, t= .210). Hence Hull hypothesis is accepted and it is concluded that there is no significant difference between teachers and students regarding the attitude of students towards physics.
- Ho10. The result of tenth hypothesis is significant (p=.000≤0.05, t= -9.866). Hence Hull hypothesis is rejected and it is concluded that there is significant difference between male and female students regarding the application of physics in their daily life. The performance of female students (Mean= 43.05) is better than male students (Mean= 30.43) in this regard.
- Ho11. The result of eleventh hypothesis is significant (p=.000≤0.05, t= 9.785). Hence Hull hypothesis is rejected and it is concluded that there is significant difference between urban area students and rural area students regarding the application of physics in their daily life. The performance of urban area students (Mean= 43.20) is better than rural area students (Mean= 30.61) in this regard.
- Ho12. The result of twelfth hypothesis is significant (p=.000≤0.05, t= -12.149). Hence Hull hypothesis is rejected and it is concluded that there is significant difference between class XI students and class XII students regarding the application of physics in their daily life. The performance of class XII students (Mean= 43.50) is better than class XI students (Mean= 29.02) in this regard.

Performance of students in test

Table: 4. Overall performance of students in a test regarding the application of physics

	N	Minimum	Maximum	Mean	Std. Deviation
Score	300	10	85	35.73	12.571

Analysis of the test result

A test was taken from 300 students in order to appraise their capability to apply the concepts of physics in their daily life. The test comprised 100 multiple choice items. There were 100 marks on the test. The result of the test reveals that performance of students in a test regarding the application of physics in their daily life was very poor. The average score of the students in test was only 35.73, which indicates an alarmingly poor

performance of students regarding the application of physics in their daily life.

3. CONCLUSION

The performance of students regarding the application of physics in their daily life was extremely poor. The students and teachers were unaware of the objectives, standards and benchmarks of physics that were set by the policy makers and curriculum developers. The students believed that teachers of physics were incompetent to teach physics properly but teachers disagreed. In the same way teachers pointed out that students' attitude towards physics was not positive but students denied in this regard. However, both teachers and students equally appreciated the syllabus of physics but at the same time they told that English medium has created a great obstacle for both teachers and students to make teaching learning of physics effective.

There was strong correlation between independent variables - (syllabus, teachers' competency, students' attitude & understanding of concepts) and dependent variable - application of physics in the daily life of students. However, no significant difference was found between teachers and students regarding syllabus, understanding of physics concepts and application of physics in the daily of students but significant difference was found regarding teachers' competency and students' attitude towards physics.

Suggestions

1. The performance of students regarding the application of physics in their daily life is extremely poor. The teachers teach and students study physics only to pass the examination for further admission in higher classes but no focus has been given on the application of physics in the daily life students. The memorization and rote learning is being promoted in this regard that is very dangerous for creativity and logical thinking. Policy makers should address this issue seriously to make the physics useful for those who discontinue their study after intermediate along with those who go for further study.
2. The teachers and students do not know the objectives, standards and benchmarks of physics. Policy makers and curriculum developers should clearly mention the objectives, standards and benchmarks in the books of physics so that students and teachers make their teaching learning effective accordingly.
3. The teachers and students appreciated the syllabus but syllabus being in English has become very difficult for them to understand and apply in their daily life. The ninth and tenth class physics is in local language but eleventh and twelfth class physics is in English. Therefore, policy makers should translate the books of physics in local language to enable the teachers and students to understand and apply the concepts of physics properly in their daily life.
4. There is a misunderstanding between teachers and students regarding the competency of teachers and students' attitude towards physics. Students believe that teachers are incompetent and incapable to deliver and teachers believe that students' attitude towards physics is not positive. Policy makers should address this issue to create encouraging teaching learning environment.
5. The teachers did not use modern and latest teaching methods and A. V. aid for teaching physics. Teaching learning of physics without latest methods and A.V aids cannot be effective. Therefore, policy makers should address this issue properly.
6. The teaching learning of physics is mostly theoretical. The practical aspects of physics have been given less focus. The teaching learning of physics should be made activity based in which practical aspects of physics should be encouraged more than theoretical aspects.

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