JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

COMPUTER BASED ASSESSMENT OF SCHOOLS IN KERALA: A CASE STUDY

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Abstract: *With the literacy rate of 96.2% in the state of Kerala, the student's education system in schools are evaluated under Paper Based Assessment (PBA) rather than a Computer Based Assessment (CBA). CBA has become an inevitable part in Computer Aided Learning environments as advancements in digital technologies have been revolutionized. Since Kerala is developing and also proved in incorporating many digital technologies, in the field of education, they proved in bringing CBA over aptitude tests, for interviews, MCQs in PSC assessment and many more, but there are no advancements in bringing CBA over school level. So to analyze this situation, this paper brings a detailed analysis of CBA over schools in which initially the education system of Kerala is depicted, followed by a case study in which we try to analyze the condition using Computer Based Assessment Model (CBAM) over students from 20 schools of Kerala and mainly to analyze variables such as Social Influence, Perceived Playfulness, Facilitating Conditions, Computer Self Efficacy, Content, Goal Expectancy, Perceived Usefulness, Pass rate, Student Engagement and Student Satisfaction. Increased lifespan, improved student motivation, flexibility, and use are used as learning resource for the study. We also identified how much CBA is a need in the state of Kerala and also to understand the importance of using technologies these days and some possible challenges are identified through the result analysis.*

Keywords: Computer Based Assessment, Computer Aided Assessment, Digital Technologies

1. Introduction

The Kerala state's achievements in the area of education are readily apparent, as evidenced by its ranking as India's most educated state. During the British control in India, Christian missionaries were primarily responsible for promoting education in Kerala. When it comes to literacy rates, Kerala is consistently at the top of the list. In 1961, 55.08 percent of the state's population was literate, followed by 69.75 percent in 1971, 78.85 percent in 1981, 89.81 percent in 1991, and 90.86 percent in 2001. As per Indian Census, Kerala is known for having the greatest literacy rate in the nation, as well as the greatest female to male population ratio and a lower infant mortality rate. Kerala, with a population of 34.8 million people, is a developed society in regard to health, literacy, and education. Kerala is in the top three states on the Gender Vulnerability Index (GVI), which examines the condition of girls and women from the viewpoints of poverty, education, as well as health. As per the National Sample Survey, Kerala has the least poverty rate of any Indian state, with 12.5 percent of the population living in poverty (Fayaz& Mehta, 2018). Because Cochin and Travancore were not directly supervised by the British, Kerala has seen peace through the gaze of political history. In 1951, the male-female literacy gap was 22%, but it has now decreased to 4.41 percent in 2011. The district of Pathanamthitta in Kerala has the high literacy rate (96%) however Palakkad has the lowest literacy rate (88%) due to a large number of category, caste and schedule tribe in the district [1].

Education Statistics of Kerala

In 2016-17, Kerala has 12,981 schools, with 4,695 (36.17 percent) being public schools, 1066 (8.2%) being unaided schools, and 7,220 (55.62 percent) being aided schools. In comparison to lower elementary sections, there are fewer public schools in upper primary and high school. In every section, there are more aided schools than government schools. Malappuram has the highest number of schools (1,558) in the state, followed by Kozhikode (1,283) and Kannur (1,308).

Kannur district has the largest number of aided schools (963), whereas Malappuram has the largest number of unaided schools (198) and government schools (553) in the state. The table below shows the number of schools in Kerala by stage, management, and district in 2016-17. There are 1,436 schools in Kerala that provide curricula that differ from those mandated by the Kerala State Government. 1229 CBSE schools, 157 ICSE schools, 36 KendriyaVidyalayas, and 14 JawaharNavodayaVidyalayas are among them, with one JawaharNavodayaVidyalaya each district.

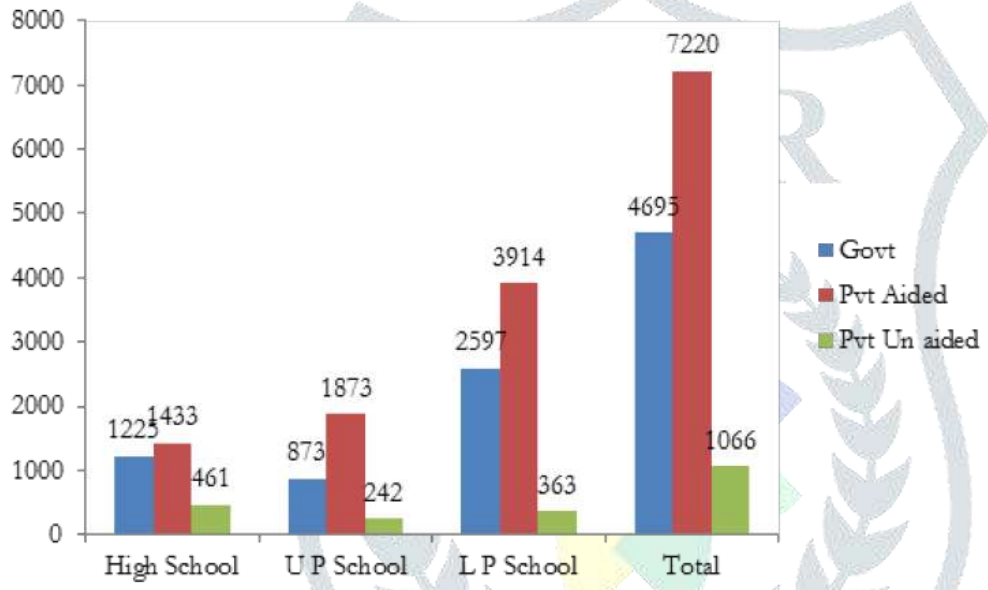

Figure.1. Management Wise Number of Schools in Kerala (2016-2017) (Ajayi&Faniran, 2018)

In the recent years, the number of students enrolled in the state has decreased from 37.02 lakh in 2016-17 to 36.8 lakh in 2017-18 (Provisional). However, there has been a small increase in enrollment in the lower primary (LP) section, with an increase of 18,066 students from 2016-17 to 2017-18. The number of students in the High School (HS) section has decreased by 28,641 over the previous year, while the number of students with in Upper Primary (UP) segment has decreased by 11,505 in 2017-18. Figure.2 depicts the stage-by-stage enrollment of students in Kerala schools from 2013-14 to 2017-18.

Table.1. District-wise/ Management-wise/Stage-wise, Number of Schools in Kerala: 2016-17 (Ajayi&Faniran, 2018)

Sl. No	District	High Schools				U.P. Schools				L.P. Schools				Total			
		G	PA	PUA	Total	G	PA	PUA	Total	G	PA	PUA	Total	G	PA	PUA	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	TVPM	131	94	50	275	101	97	20	218	306	173	28	507	538	364	98	1000
2	KLM	88	127	20	235	67	132	24	223	275	180	41	496	430	439	85	954
3	PTA	51	112	9	172	44	86	15	145	168	231	24	423	263	429	48	740
4	ALP	66	127	7	200	69	79	10	158	199	188	26	413	334	394	43	771
5	KTM	73	169	21	263	63	131	10	204	173	260	23	456	309	560	54	923
6	IDY	83	70	11	164	27	61	4	92	95	125	20	240	205	256	35	496
7	EKM	101	178	50	329	86	104	19	209	187	259	30	476	374	541	99	1014
8	TSR	86	151	34	271	57	162	10	229	120	373	37	530	263	686	81	1030
9	PKD	92	77	41	210	44	162	19	225	197	346	28	571	333	585	88	1006
10	MLP	112	88	123	323	95	231	37	363	346	488	38	872	553	807	198	1558
11	KKD	82	101	33	216	70	239	18	327	182	527	31	740	334	867	82	1283
12	WYD	62	25	5	92	22	40	7	69	90	47	9	146	174	112	21	307
13	KNR	100	79	26	205	68	279	23	370	116	605	12	733	284	963	61	1308
14	KSD	98	35	31	164	60	70	26	156	143	112	16	271	301	217	73	591
Total		1225	1433	461	3119	873	1873	242	2988	2597	3914	363	6874	4695	7220	1066	12981
Source: Directorate of Public Instruction																	

A positive shift has occurred in the enrollment of students in public and government-aided institutions. In 2017, the Lower Primary division experienced an increase of 14,268 students, with 8,070 in public schools alone, compared to the previous year's enrollment. It is a well-known fact that the number of children in Kerala has decreased over time due to the demographic shift of a low birth rate. Because of shifting students from unaided schools, the enrollment in public schools has increased. There is also reason of this decrement in many states where student changes their enrollment from one to another school due to aesthetics, technology facility and also availability of resources.

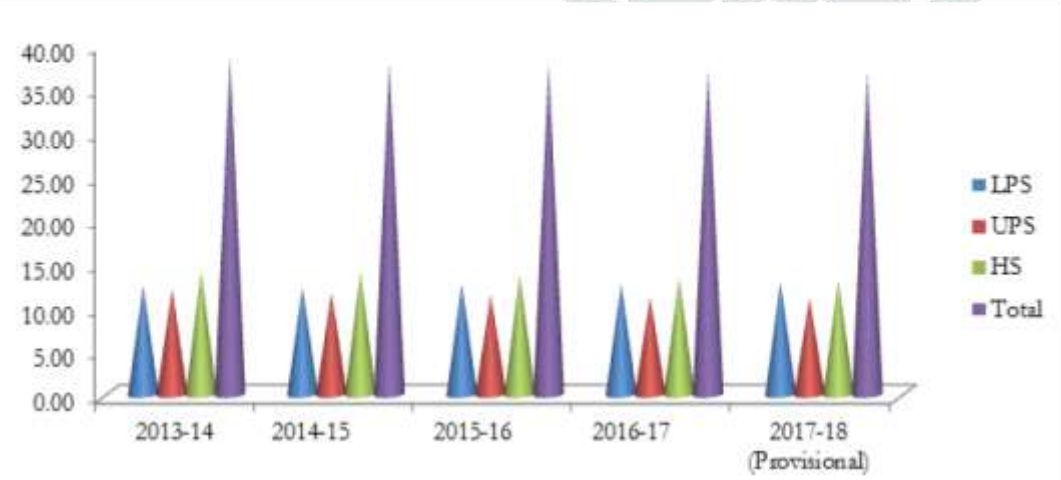

Figure.2. Stage-wise Enrollment of Students in Schools of Kerala (in lakh) (Ajayi&Faniran, 2018)

1.1 Computer Facilities

Computer facilities are only found in 37% of public upper primary schools and 13% of public elementary schools, but they are present in more than 70% of higher secondary and 60% of secondary schools operated by the government (Table. 2). There are still plenty of computer-equipped schools, both public and private, including 32 percent of unrecognized ones. Significant numbers of recognized Madrasa have computers (Bandhopadhyay, 2009) (Economides &Terzis, 2011; Keegan & Schoen-Phelan, 2016). Computer-aided learning in government schools, particularly at the primary and upper primary levels, is clearly needed to address the issue of digital divide in India 06].

Table.2. Percentage Share of Schools with Computer Facility

Category of school	Public	Private Aided	Private Unaided	Unrecognized	Madrasa Recognized	Total Schools
Primary	13.13	45.80	54.73	31.84	18.56	22.34
Upper Primary	37.43	60.15	62.00	51.90	28.91	46.33
Elementary	16.63	52.08	53.44	30.88	20.71	25.23
Secondary	60.26	76.85	70.50	50.73	44.72	66.82
Hr. Secondary	68.99	84.84	68.76	62.32	49.65	71.39

1.2 Computer Aided Learning (CAL)

Despite the presence of computers, the percentage of schools with CAL facilities is relatively low at all levels, including secondary school, and there is no difference between private and public schools at other levels (Table. 3) (Ajayi, 2002; Ihumoa, 2008; Bansyopadhyay&Dey, 2011).

Table.3. Percentage Share of Schools with CAL

School Category	Public	Private Aided	Private Unaided	Unrecognized	Madrasa Recognized	Total Schools
Primary	7.72	13.63	22.08	20.39	10.34	10.88
Upper Primary	22.51	19.04	25.22	36.15	16.57	23.21
Elementary	9.42	15.88	21.25	19.58	11.54	12.07
Secondary	27.56	27.01	30.60	27.99	21.92	28.63
Hr. Secondary	34.00	38.74	36.03	36.22	27.68	35.63

According to state-by-state variations, less than 10% of government elementary schools in India (25) have CAL facilities. The number of states with fewer than 10% government schools having CAL facilities has decreased as the

level of education has increased, with seven states at the upper primary level, four at the secondary level, and two at the higher secondary level. In the case of private aided and unaided schools, the situation isn't much better, with 14 states having fewer than 10% primary aided schools with CAL, and 8 states having less than 10% primary unaided schools. As a result, there are a total of 10 states with 10 percent of their schools possessing CAL facilities (Figure. 3).

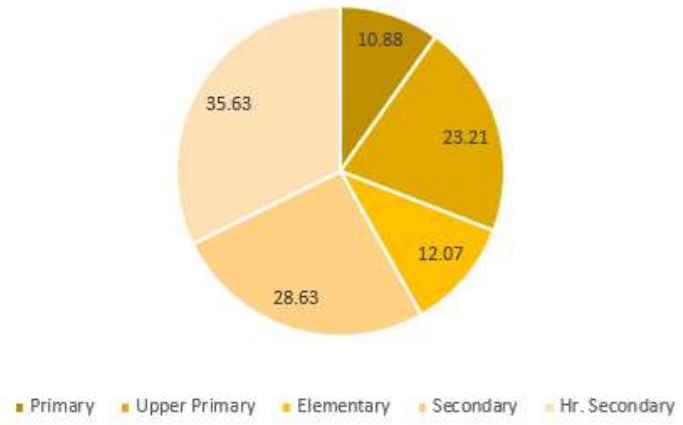

Figure.3. Percentage of Total Schools Having CAL Facility

1.3 Key Objectives

This paper of case study is focused on building a Computer Based Assessment in schools of Kerala in which following are the highlights;

a. Presenting a case study for bringing CBA for schools in Kerala
b. For analysis, a Computer Based Assessment Model (CBAM) is proposed
c. Using CAM, 14 variables are analyzed.

Organization of the paper: As we come across the education system, some of the statistics related to CAL are viewed in Section 1 and remaining section of this paper is as follows; Section 2 depicts the CBA in detail, followed by Section 3, the proposed model for analyzing (CBAM), Section 4 gives the results and finally Section 5 ends with conclusion.

2. Computer Based Assessment (CBA)

CBA has undergone a steady growth in use since it first arose in educational settings in the 1950s. For each decade between 1950 and 2000, Burkhardt and Pead (2003) (Burkhardt&Pead, 2003) give a good review of the evolution of CBA in educational settings: (Ajayi&Faniran, 2018)

1950s: Early computer featured games, riddles and "tests"; compilers were meant to detect syntax and subsequently design problems in computer programming.

1960s: The ancestors of learning machines, who understood the need of evaluation in the delivery of learning programs, recognized the usefulness of computers in providing learning programs.

1970s: In a self-reinforcing loop, the tremendous advancement of multiple-choice testing in US education increased the appeal of automatic marking.

1980s: With less focus on evaluation, a wide range of instructional software has been developed to aid learning.

1990s: Integrated learning systems, a more complex evolution of the learning machines of the 1960s, came to be regarded more seriously in tandem with the further progress of multiple-choice testing.

Clarke, Madaus, Horn and Ramos's (2000) (Clarke et al., 2000) account of the pervasiveness of multiple-choice testing in the US throughout the 1970s illustrates the various degrees to which assessment has influenced technology-facilitated education. Figure.4. illustrates the growth in research activity as a result of searching online databases and filtering by publication year. According to the quotation above, CBA developments in the mid-1990s led to a substantial rise in the accessible study of literature (Thelwall, 2000; Hardman, 20005; Fluck et al.,2009; Schoen-Phelan et al., 2016).

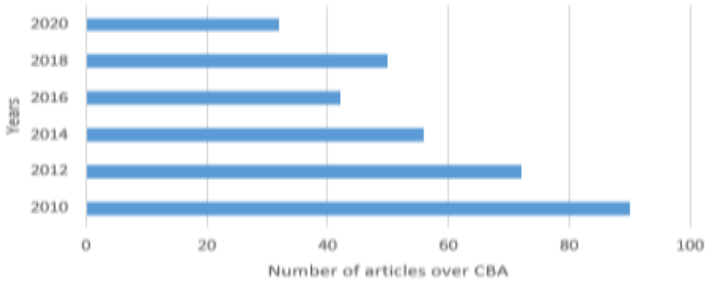

Figure.4. No. of Articles on CBA Published Over Years

The most surprising assertion to emerge from major texts (Brown, Race, and Bull, 1999) (Brown et al., 1999) is that CBA is a supporter of formative evaluation. Given Black and Wiliam's constant concern in their research work "Inside the Black Box" (Black and Wiliam, 1998) (Black &Wiliam, 1998), parts of which have made their way into UK Government education policies (DCSF, 2008) [11], a discussion on the link between CBA and formative assessment would seem unavoidable.

2.1 Relationship between CBA and Formative Assessment

According to Black and Wiliam's studies, CBA might have an influence on the following aspects of formative assessment practice:

Rather of comparing students, teachers should focus on the specifics of their work and offer suggestions on how they might improve. However, tests and homework activities must be clear and related to the learning goals. Those who are being evaluated should offer suggestions on how to improve, and each student should be given the chance and assistance to work on the improvement themselves (Black and Wiliam, 1998, p.9).

Students can receive feedback on their strengths and shortcomings based on their responses to assessment questions using CBA, if appropriate procedures for data analysis are in place. CBA's automatic marking has the ability to offer students with fast feedback, allowing them to immerse themselves in self-assessment. However, as Black and Wiliam point out, CBA feedback alone is unlikely to help students build their self-assessment abilities.

As a result, students should learn how to analyze themselves so that they understand the primary goals of their learning and what they need to do to accomplish them. (1998: Black and Wiliam). (Black &Wiliam, 1998)

Other concerns stated by Black and Wiliam, such as ensuring that "the interaction between a student and a teacher should be deliberate, introspective, focused..." are less clear. 'Computer Aided Education in Higher Education' (Brown et al., 1999) raises the following concern:

Students are studying a growing part of the curriculum utilizing computer based resources in most subject areas... It's become more and harder for children to study and be assessed in a way that works for them. (Bull and colleagues, 2003) (Bull & McKenna, 2003)

2.2 Relationship between CBA and Student's learning

Much thought has gone into the subject of learning and evaluation interrelationships. "The consequence of work in cognitive science for the evaluation of student understanding is that we do need to focus on the patterns that students

construct for themselves," explains Gipps' theory of educational testing (Gipps, 1994). In other words, if the student's learning models are heavily based around the use of technology, then the use of CBA in educational assessment is clearly justified. We need a larger spectrum of evaluation techniques to measure more than just subject-matter proficiency, says Gipps. Because technology usage is part of our "broader corpus of cognitive characteristics," CBA would be the appropriate evaluation approach (Haigh, 2010).

3. Case Study

3.1 Data Collection

The partakers in this research experiment were wards from over 20 schools from various districts such as Malappuram, Trivandrum, Kottayam, Kasaragod, Kannur, Idukki and Pathanamthittaof Kerala in which more than 2000 students participated for attending CBAM test based on their subject assessment. Here we took one language subject say “English” and also “Mathematics” as practical subject. With a mean of 5.03 and a standard deviation of 1.2, we can infer that students understood that they knew the basics of using a personal computer. Most of the students received computer classes in high school and utilized the PC for web surfing and video game playing.

For the language paper, "English," 60 multiple-choice questions (MCQs) were provided, and for the practical test, "Mathematics," 1.45 hours was given. A pretty clear explanation of CBA method was given. The student must pick the correct answer and then click the "next" button to proceed. Each page had a question, four alternative answers, and a "next" button at the bottom of the screen. There were no specific instructions offered by the professors at the beginning of the course. They only assisted a small number of students who weren't happy with the assessment's use and sought for further information. Due to the system's architecture and aesthetics, we don't want these two influences on our model to affect it in any way. A Windows 10 PC was used for the CBA and CBAM.

3.2 Variables Measured

In order to identify the overall 14 variables from this CBAM, we have also done some modifications in which we incorporated the language module where these MCQ can be attended by English medium students. As the DL model advances, every task becomes easier than imagined. All items were evaluated using a seven-point Likert-type scale, from 1 strongly disagree to 7 strongly agree. These items have been widely utilized in numerous prior studies on acceptance, and they are still being used today. Davis (1989) (Davis, 1989) provided three items for Perceived Usefulness (PU). Three items were used from the same research for Perceived Ease of Use (PEOU) (Davis, 1989) (Compeau et al., 1995). We modified four questions (Teo, 2009) to measure computer self-efficacy (CSE). To create the Social Influence (SI) design, four items from the UTUAT were modified (Venkatesh et al., 2003). We used two elements for Facilitating Conditions (FC) (Thompson, 1991). On the basis of two investigations (Kim & Moon, 2001; Wang, 2003), four items for Perceived Playfulness (PP) were created. A total of four and three items developed by us were used to measure the constructs of content and goal expectancy (GE). Three components of behavioral intention to use have been modified by us from Davis (1989). Also, weanalyze other variables like pass rate, student engagement and student satisfaction, increased lifespan, security and flexibility, improved student motivation, and use, as learning resource criteria. The Likert type scale was used to obtain the feed-back from students.

4. Result Analysis

Here we are now discussing the after effects of the CBAM test that over 2000 students have written in which over 80% of students passed the exam and rest 20% failed the exam because they studied what in the book rather than searching for other resources that is fully available over the internet.

The variables used for analysis are mentioned below;

Perceived Playfulness (PP) was initially established as an essential internal notion based on the individual experience of the system using the acceptance model (Thompson et al., 1991). Three dimensions are used to interpret perceived playfulness: (a) Concentration: If the user is completely focused on the task at hand. (b) Interest: If the user's cognitive curiosity is piqued (Malone, 1981a; 1981b). (c) Satisfaction: If the user loves interacting with the system.These three aspects are interconnected and linked, although they aren't usually noticed together in practice. As a result, each dimension does not represent the entire interaction. These three aspects of Perceived Playfulness are critical to the success of a CBA implementation. A CBA must maintain a high degree of focus, interest, and delight in the student. As a result, we expect Perceived Playfulness to have a positive impact on Behavioral intention. As a result, we came up with the following hypothesis:

H1: Behavioural Intention will benefit by perceived playfulness.

Perceived Usefulness (PU) is defined as a person's belief that utilizing a certain system would improve his or her work performance (Davis, 1989). Many studies (Lai &Ong, 2006; lee,2008; Raaij et al., 2008) show that perceived usefulness affects behavioral intentions to utilise a learning system (e.g. Lee, 2008; Ong& Lai, 2006; Van Raaij&Schepers, 2008). Similarly, students may believe that using a CBA system would improve their course knowledge, understanding and performance. Furthermore, if the CBA is beneficial to the student, it will aid in increasing the learner's focus, interest, and, most likely, enjoyment. As a result, we expect Perceived Usefulness to have a positive influence on Perceived Playfulness. Through Perceived Playfulness, this connection produces an indirect influence of Perceived Usefulness on Behavioral Intention. As a result, we came up with the following hypothesis:

H2: The Behavioral intention to utilize CBA will be positively influenced by perceived usefulness.

H3: Perceived Usefulness will influence Perceived Playfulness positively.

Perceived Ease of Use (PEOU) is the degree to which a person feels that utilizing the system will be painless (Davis, 1989). Perceived Ease of Use is predicted to impact directly Perceived Usefulness and Behavioral Intention to Use (Agarwal& Prasad, 1999), according to previous study. Perceived Ease of Use will enhance Perceived Playfulness because ease of use ensures that the system runs smoothly and without irritating interruptions.As a result, we predict Perceived Ease of Use to have a positive impact on Perceived Playfulness. Similarly, Perceived Ease of Use influences Behavioral Intention to use indirectly through its impact on perceived usefulness and playfulness.

H4: Perceived Ease of Use will have a beneficial impact on the Behavioral Intention to use CBA.

H5: Perceived Ease of Use will have a beneficial impact on Perceived Usefulness.

H6: Perceived Ease of Use will have a beneficial impact on Perceived Playfulness.

Computer Self-Efficacy (CSE) is an individual's perception of his or her ability to utilize computers (Compeau& Higgins, 1995). Previous research has shown that Computer Self Efficacy and Perceived Ease of Use have a causal relationship (Agarwal, 2000). As a result, CSE has a significant direct impact on PEOU, as well as an indirect impact on Behavioral Intention to use the system. Computer self-efficacy has a variety of effects for students in CBA. Students with stronger IT abilities, for example, save time by clicking or typing more quickly. In a CBA, time is extremely important. As a result, the CSE variable must be included to provide a more complete explanation of CBA acceptance.

H7: Perceived Ease of Use will benefit with increased computer self-efficacy.

Social Influence: When it comes to Social Influence (SI), Taylor and Todd (1995) define it as a combination of other people's opinions as well as superior influence and peer influence. There are three components to social influence: Subjective Norm, Voluntarine, and Image. Social variables (MPCU), image (IDT), and behavioral intention were all utilized in previous models to measure social impact (TRA, TPB, C-TAM-TPB and TAM2). Users'

perceptions of the system's utility will be influenced by Subjective Norm and Image, according to TAM2. In addition, TAM2 implies that the subjective norm has no direct influence on the Behavioral Intention provided the system is used freely. When it comes to Behavioral Intention, Social Influence is one of the four most important factors in the UTUAT model, which condenses the preceding eight models. In many cases, students are unsure about the purpose of CBA. They may have never used a system like this before. They are discussing CBA between themselves. We think that students will take into account the opinions of their peers, their friends, and their elders while forming their opinions. In addition, the perceived usefulness and added value of the system is a major issue of discussion. There is a clear correlation between perceived usefulness and social influence. As it is now, CBA is a voluntary process. TAM2's suggestion for voluntariness means we won't be looking at the effect of social influence on behavioral intentions.

H8: Perceived Usefulness will benefit from Social Influence.

Facilitating Conditions (FCs): A person's opinion that a process may be performed is influenced by Facilitating Conditions (FCs). FC has several facets. As a result, the definition of FC will vary according to the system, the procedure, or the people who will supply them. For example, technical support, like helpdesks and online assistance services, might be included in FC. One of the reasons offered for the existence of FC is what it has to do with the availability of resources such as time and money. The laws, regulations, and legal environment of a system can also be used to show FC. When it comes to our study, FC refers to the assistance provided during the CBA. In order to assist students, the CBA must provide them with tools. An expert must be present during the CBA if it takes place at the university to answer students' questions about the usage of CBA or the content of the questions. So, we anticipated that FC would have a positive influence on PEOU.

H9: This will have a positive influence on the perceived ease of use.

Goal Expectancy: The need for self-direction and goal orientation in distant learning has been documented in previous research. A person's self-management of learning is defined by Smith et al. (2003) (Smith et al. 2003) as the degree to which they believe they have self-discipline and can commit to autonomous learning. To add to the list, Yi and Hwang (2003) have identified learning goal orientation (LGO) as an important influencer on the acceptability of online learning, drawing on Nicholls' (1984) findings (Nicholls, 1984). Two types of goals were presented by Nicholls (1984). In the first case, the goal is to learn, whereas in the second, the goal is to perform. They desire to learn new things or increase their level of expertise. On the other hand, people with Performance Goal Orientation believe that their intellectual capacity is a fixed entity.

Because of this, we came up with a concept called Goal Expectancy (GE). An individual's goal expectancy (GE) is a factor that influences his/her opinion that they are ready to employ CBA. For this variable, we suggest two dimensions: As a first step, in a summative exam such as ours, students must study and be prepared so that they can answer the questions correctly. A student's CBA preparation is a major factor in determining how well they do in their exam. A student's satisfaction with his/her preparation is measured by this dimension, which does not assess preparation in terms of quality or quantity. It's also important for each kid to know how far they want to go in order to win. It is the student's responsibility to set a target for the proportion of correct answers that will allow him/her to achieve a satisfactory performance. Assume that GE and perceived usefulness are significantly linked. As a result, the outcome of the GE is dependent on the method of assessment. We believe that GE will have a positive influence on PU in the long run. Students who are prepared for the examination will find it more useful since they will be able to comprehend what is being asked and answer it correctly. In a formative evaluation, the effect may change the sign. When students employ formative assessment, it is more to help them learn than to test their understanding. So, GE might have negative effect on the PU of a formative assessment. As a result, we evaluate GE's positive influence on PU. It is also anticipated that GE would have a beneficial influence on Perceived Playfulness (PP). The three dimensions of PP will be easier to understand for a learner who has a good grasp of the material. In order to meet his/her expectations for a successful performance, the student will remain engaged with the CBA. The prepared learner with high expectations will also appreciate the contact with the system since he/she will be able to accurately answer the questions asked of them. As a result, we proposed:

H10: Perceived Usefulness will benefit from Goal Expectancy.

H11: Hence Perceived Playfulness will increase.

Content: Because they automate content delivery, e-learning systems rely on information and communication technology. The System Content variable, according to Shee and Wang (2008) (Shee& Wang, 2008), has a significant role on learners' satisfaction. A non-technical specialist such as a teacher is also required for the system's training, operation, and maintenance. CBA is unquestionably closely linked to the course's content. The content of the course determines the questions that will be asked in the CBA. CBA is used by instructors to track students' progress in the classroom to help them improve. The CBA also give students the opportunity to identify their deficiencies. CBA can be used by students to better comprehend and practice the course material. Content is examined from two separate angles in our study. Let's start with the course's actual material. It is possible that the content of CBA will impact its utility and fun factor. Students rate their courses based on the information they have learned in them. Whether a course is tough or easy, fascinating or dull, useful or not useful can be influenced by its content. Another aspect of the CBA is its substance. The topic of the questions raises important problems. The fact that we analyze content using new objects and for a different aim than prior research allows us to conclude that content is a separate concept. It's important to determine whether or not the Content variable will have a direct impact on Behavioral Intention, Perceived Usefulness, Perceived Playfulness, as well as Goal Expectancy.

H12: Perceived Usefulness will benefit with Content.

H13: Perceived Playfulness will improve as a result of the Content.

H14: Goal Expectancy will be positively influenced by Content.

H15: The Behavioral intention to use CBA will be influenced by the Content.

The findings of the measuring model are shown in Table.4. Figures.5 and 6are graphical representations of Mean, Factor Loading, Standard Deviation (SD), and Measurement Reliability for Perceived Usefulness, Content, Perceived Playfulness, Social Influence, Facilitating Conditions, Goal Expectancy, Ease of Use and Computer Self-Efficacy.

Table.4. Results of variables

Measurements	**Mean**	**SD**	**Factor Loading (> 0.7)**	**Reliability**
Perceived Playfulness	6.45	1.03	0.85	0.84
Perceived Usefulness	4.67	0.94	0.87	0.83
Ease of Use	6	1.3	0.7	0.95
Social Influence	7	0.84	0.73	0.87
Computer Self Efficacy	4	1.6	0.9	0.91
Goal Expectancy	6	1.45	0.78	0.83
Facilitating Conditions	6.02	0.6	0.95	0.91
Content	6	0.89	0.72	0.87

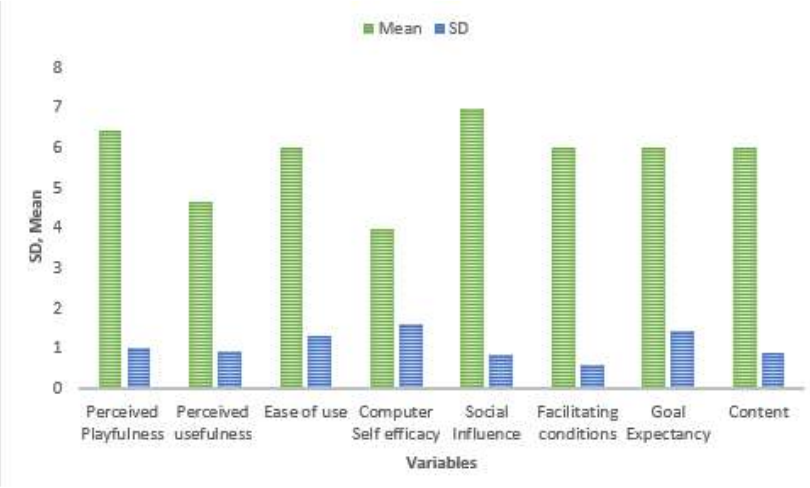

Figure.5. Mean and SD vs Variables

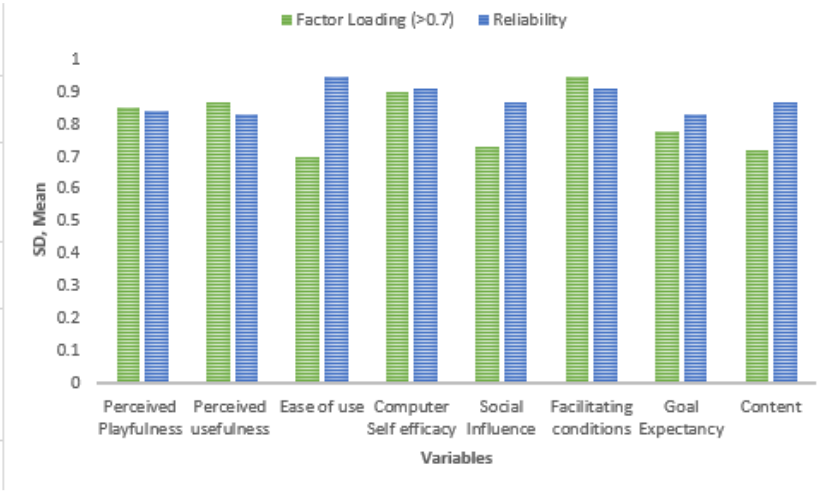

Figure.6. Factor Loading, Reliability vs Variables

Other measures used are self-explanatory from their names such as pass rate, student engagement and student satisfaction. Also, we analyzed increased lifespan, flexibility, improved student motivation, and use as a learning resource for the study (Thelwall, 2000; Nguyen et al., 2017) (Ricketts &Wilks, 2002; Economides &Terzis, 2011).

Pass Rate*:* It is the percentage result from the students to get scored from the required mark. The score of some students is given in Table. 5 in which most of them have taken above 40 questions out of 60 questions for the subject "Mathematics" and for the subject "English" over 50 questions were taken out of 60 questions. Figure.7 shows the graphical representation of the pass rate of students in which out of 2000 students attended, over 1,500 students passed and remaining 500 failed (30%) in one subject due to the reason, learned only from the specific area and somewhat prepared for the test. The model has a limit where the mark above 25 is passed and below 25 is fail.

Table.5. Students' Marks Based on CBAM Model

Students	English (out of 60)	Pass/Fail	Mathematics (out of 60)	Pass/ Fail
S1	52	P	50	P
S2	43	P	50	P
S3	50	P	35	P
S4	49	P	23	F
S5	24	F	20	F
S6	55	P	44	P

S7	40	P	17	F
S8	10	F	12	F
S9	11	F	30	P
S10	24	F	27	P

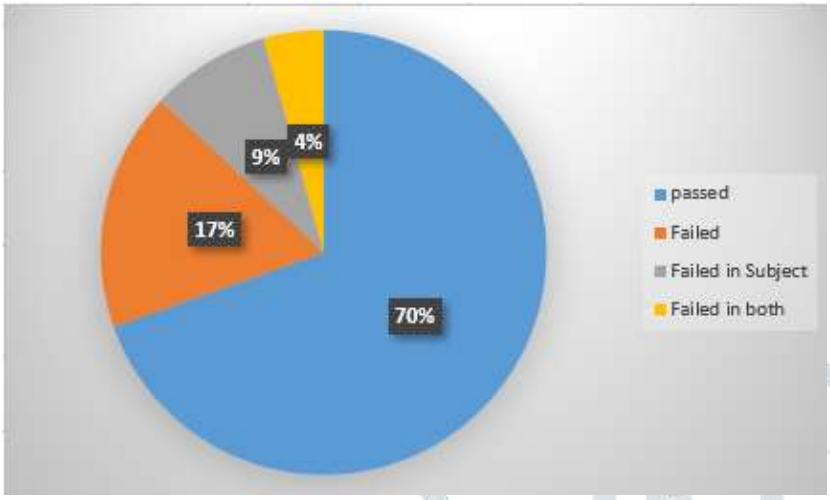

Figure.7. Overall Pass and Fail Percentage Using CBAM

Student Engagement and Satisfaction: As we knowCBA in schools are new for the students and to grasp in matter is little bit time consuming, they have mostly used computers in schools for gaming and other purposes. These parameters were analyzed using the survey that we did with the end of the exam in which the graphical representation is shown in Figure.8. From that we can totally understand that they find much joy as the graph shows higher rating from the Likert scale. Also, we can see some minor scaling in which students find comfortable with.

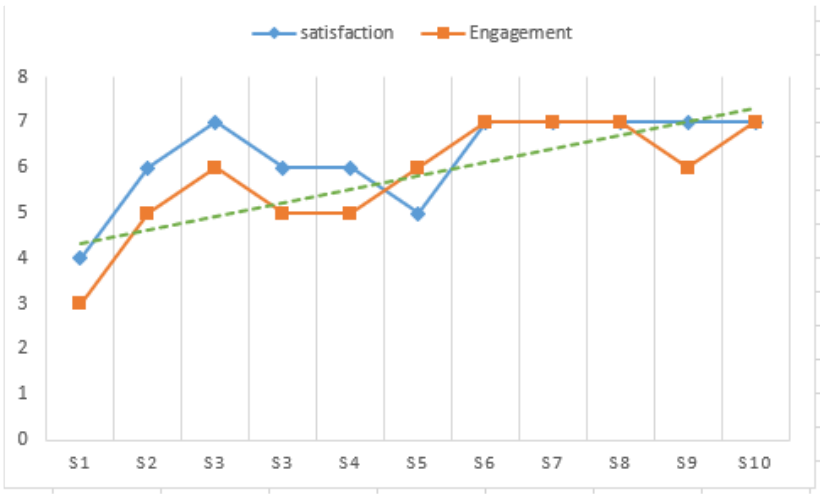

Figure.8. Satisfaction, Engagement Scaling

Lifespan: This measure gives the time of the exam. As per MCQ, we took considerable amount of time for solving questions that are not that hard to find. Also, while doing this, students can use the extra time which are not gained during the manual paper-based exam for revisioning the entire question and finally submit. Also, some of the students went time out even though they had some questions to fill up, but those questions will be marked as unanswered and points only gained by the students who attend those questions. So, from the survey as shown in Figure.9, its clear that the 87% finished the exam with perfect time, 13% ends time out.

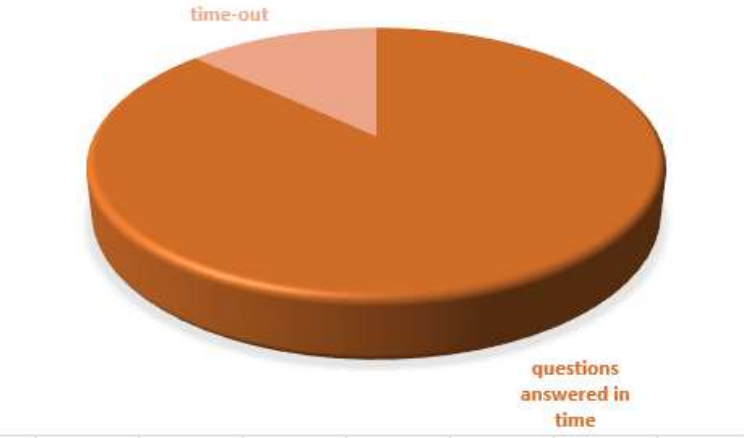

Figure.9. Overall Lifespan from Likert Scaling

Flexibility*:* As CBAM model is new to most of the school students, initially it will be tough to use. But later, it probably ends up in joyful manner were students can write these exams, tension free providedthey don't need to carry anything additional other than pen.Theycan use internet for accessing resources and learn extra before entering into the exam. So in Figure.10, it shows the graphical representation of flexibility in Likert's scale in which most of them liked this method and also specifically 82% of boys and girls accept this method.

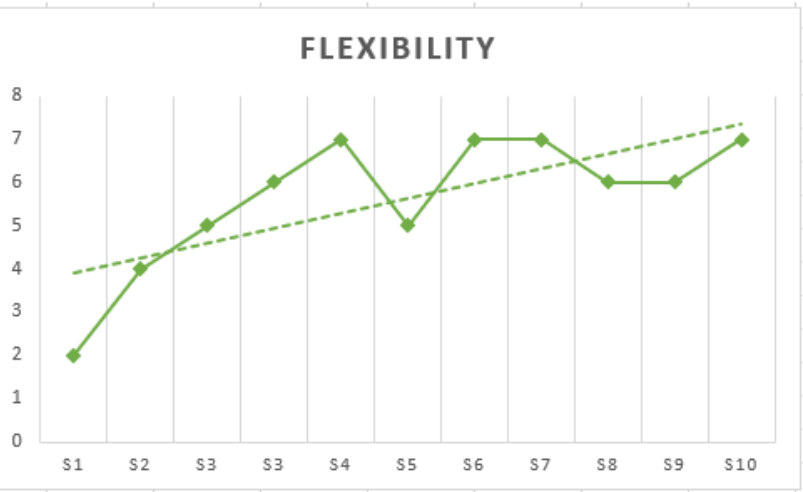

Figure.10. Flexibility Using Likert Scale

Improved Motivation: It shows the exposing of students to this type of test ambience and after the initial test; they get so motivated to attend the rest of the exams and also don't even take much time as we all do in manual paper-based exam. Figure.11 shows the graphical representation of motivation using the Likert scale in which most of the students are rated as 7 and some minor cases rated as 3.

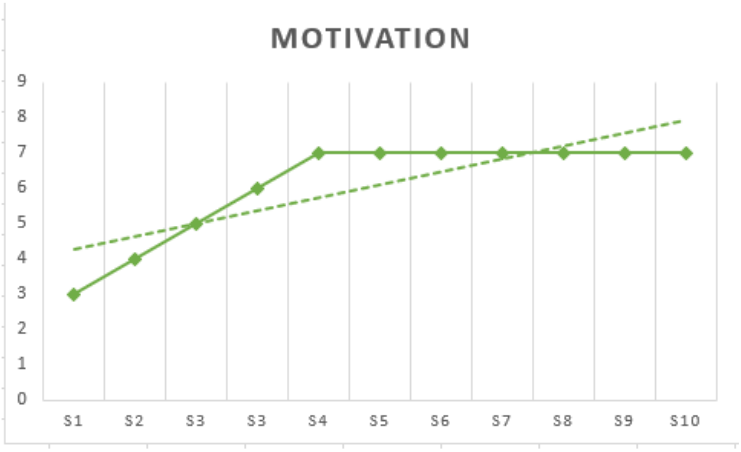

Figure.11. Motivation Using Likert Scale

Learning Extra Resources: This is the last and most important measure in which students in Kerala mostly learn what is in book, rather referring other resources available in internet. Mostly we see this in school students rather than college students. So, learning a subject not only from the book but also referring other online resources helps to understand concepts visually, figuratively or through any mediums that improves extra knowledge in using device technologies and also its vast area.Figure.12 shows the graphical representation of this measure in which from 2000 people, 40% learned book and 40% learned book and other resources and 20% read only other resources.

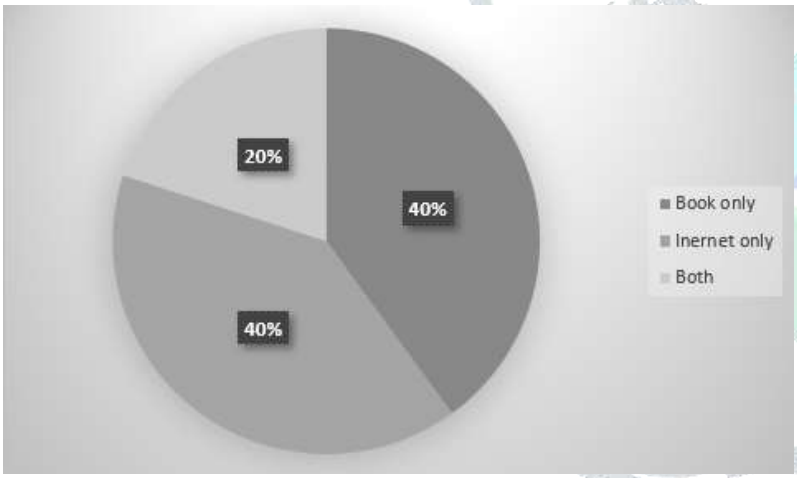

Figure.12. Learning Extra Resource Measured Using the Likert Scale

5. Conclusion

From this case study, we literally find the importance of technology using in schools of Kerala in which we initially depicted the education system and how these districts are fond of computer facility. We also analyzed the factors that affect while taking CBA in schools and over 14 variables were taken in this case study to analyze the condition. From the analysis, we found that most of the students are fond of using this CBA ambience, very few are likely to go with paper-based assessment. Also, this case study gives the usage of computer in schools at a high level and makes them study use resources that are available on internet wider, than sticking up what they have fed.

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