# FACTORS THAT IMPACT ON  THE USE OF COMPUTERS IN TEACHING / LEARNING IN TAMIL SCHOOLS

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## 1.   INTRODUCTION

The world of today is, to a major extent, computer-driven while the world of  tomorrow will inevitably  be IT-based.  Computer savvy kids will therefore have a  headstart over the  computer-illiterate. IT (Information Technology)  or  ICT (Information and Communication Technology) should  no longer  be seen as an option but rather as an integral part of  the school experience for everyone.

As far back as 1968, Michaels (quoted in  Riesdel and Clements, 1985:12) stated that children need to be equipped to cope with an information society; they would, otherwise, be regarded as 'functionally illiterate' and therefore, unemployable.  Hawkridge (1990) also emphasised the importance of  acquiring computer skills as a foundation to students' future careers.

The Malaysian government, particularly with the far sightedness of  Prime Minister Dato Seri Dr Mahathir Mohamad has been allocating a lot of the resources of the country to promote and enhance computer literacy skills . The Computer Literacy Pilot Project, which  was launched in 1986, sought to  incorporate such skills as part of the school curriculum. The Multi-Media Super Corridor (MSC), launched on 1 August 1996 by the PM (NST 29 May 1997), and the Smart Schools project  (Star, 6 August 1997) are part of the overall design to upgrade the computer skills of a nation to meet the challenges in an ever-changing IT-configured world.

There is no doubt that Information technology (IT) can be  utilised as a tool to help students learn more effectively and to assist teachers to carry out their teaching duties more efficaciously. The Smart Schools project, which started operations in January 1999, is described as a means of revolutionising learning from a memory-based, teacher-centred education to one that is  creative and  learner-centred, and capable of addressing the different needs and learning capacity of students.

However, it is contended that the hype over Computer-Assisted Learning (CAL) may come to naught, if  certain key elements are  not in evidence.  Hope, Taylor and Pusack (1984) concluded that it will able to do what it claims only 'to the extent that the teacher makes it so'. Other researchers, for instance, Ketterer and Giannone (1996), also arrived at the same conclusion. So, presumably, without the support of teachers, CAL  may well turn out to be expensive and time-consuming experiment without the expected returns.

This paper will, therefore address the issue of the factors that impact on the use of computers as a learning / teaching tool in Tamil schools. To do this, the

researchers/writers obtained the views of the Tamil teachers, as well as, the Principals and Computer Resource Persons and/ or computer teachers in five urban Tamil schools. An analysis of the data obtained, separately and collectively, resulted in the emergence of several factors. Building on these factors, both positive and negative, the writers have put forward some suggestions for consideration, if schools wish to embark on a computer literacy programme. It is also our contention that these principles could apply to any other type of school other than the Tamil schools.

## 2. METHODOLOGY

### 2.1 RESEARCH QUESTIONS

The research sought to identify the status quo on the use of computers as a teaching/ learning tool in Tamil schools, together with the skills and knowledge of the Tamil teachers and their attitudes towards computer use as an educational tool.

Based on the data, the researchers then attempted to answer these basic questions:
1. What factors have a positive impact on the use of computers in teaching and learning?
2. What factors have a negative effect on the use of computers in teaching and learning?

### 2.2 SAMPLE / SCHOOLS

The research was conducted as an exploratory study, using a convenience sample of five schools in Selangor dan Wilayah Persekutuan (two adjoining states). These schools were selected because they met certain predetermined criteria:
1.     location i.e. they are in urban areas
2.     computer facilities: availability or non-availability, within the school.

However, it should be noted that the status of two of the schools in the study had changed: initially, they were considered as not having computer facilities but the infrastructure for setting up a properly equipped computer lab had already been established by the time the research was conducted. This did not significantly alter the research findings.

### 2.3 RESEARCH INSTRUMENTS

Given that the staff (principals, teachers, computer resource persons and teachers) play a key role in the successful achievement of computer literacy, it was decided that they should be the focus of the research. The data obtained through the three instruments (see below) were to inform the conclusions presented in the paper.

The instruments were:

1.     **A four-segmented questionnaire in Tamil**: administered to all Tamil teachers in the five schools focusing on their knowledge of computers; attitudes towards the

use of computers as a learning/ teaching tool; and their opinions/ knowledge of the state of the computer-related facilities available in their schools.

These questionnaires were administered with their respective principals' knowledge and cooperation. Generally, they were given time to complete the questionnaire and they were instructed to answer all the questions.

2.  **In-depth interviews of the principals** : these lasted about half an hour and were based on a standard interview guide. Principals were also asked to elaborate on needs and comment on immediate and foreseen future problems.

3.  **An interview with the computer resource persons and/ or computer teachers:** this followed a similar pattern as the above (2). This was accompanied by a tour of the facilities, thus providing instant and observable verification of the explanations.

The interviews with the principals were conducted by one researcher, while the one with the computer resource persons and computer teachers was conducted by the second researcher. This was to minimise discrepancies in inter-rater reliability.

## 3.   DATA ANALYSIS

### 3.1   QUESTIONNAIRE AND TEACHER'S RESPONSES

The questionnaire was divided into 4 segments. Teachers were asked to respond to a series of structured items to elicit their responses in mainly controlled responses, although the few open ended questions requesting elaboration for the major part did not elicit much response.

### 3.1.1 First Segment: Personal Information

The first segment dealt with teacher demographics which was limited to age, sex and educational qualifications and training (see Table 1)

**TABLE 1: PERSONAL INFORMATION**

| AGE GROUP | NUMBER | QUALIFICATIONS | | TRAINED |
|---|---|---|---|---|
| | | MCE/SPM | STPM | YES |
| 20-30 | 48 | 32 | 14 | 27 |
| 30-40 | 51 | 28 | 23 | 43 |
| 40-50 | 20 | 16 | 4 | 17 |
| 50-55 | 6 | 5 | 1 | 4 |
| TOTAL | 125 | | | 91 |

Given the fact that the teaching profession is predominantly female, it came as no surprise that out of the 125 questionnaires that were finally used in this research (not shown in table), only 21 were male i.e. (16.8 %). While it would have been interesting to look at the gender perspective in the responses, it could be discounted without affecting the outcome. So the numbers shown in the tables include both males and females, but if a significant conclusion based on gender was worth drawing attention to, it would be mentioned.

It is obvious that the majority of the respondents are in the 20 –30 and 30 -40 age group (48 and 52 i.e. 79.2 %) which means that their role may be highly significant for two reasons:
1.	they would be in the teaching profession for a greater period of time than the older teachers or administrators and
2.	their numbers could affect the impact they and their attitudes have on the pupils.

However, at the same time, at the present moment, it would be the older 40-55 year olds who probably already, or are likely to, hold administrative positions who will play a highly significant role in whether computers acquire a prominent role in schools and in the Tamil education system itself.

Where training is concerned, if computer skills training form part of formal training, the impact would be substantive – if these skills are translated into actual action plans in the classroom. Only 91 (72.8 %) of the teachers are trained: so the question that needs to be addressed is whether this is the prevalent situation in Tamil schools. If more than a quarter of the teachers are untrained, what effect would this have on education in Tamil schools, let alone the impact on the use of computers?

### 3.1.2  Second Segment: Computer Ownership , Uses And Acquisition Of Skills

Presumably, ownership of a computer will result in a person having or seeking the skills to go with the ownership.

**TABLE 2: COMPUTERS: OWNERSHIP, USES, SKILLS**

| AGE GROUP | NO | COMPUTER OWNERSHIP | | COMPUTER USES (Multiple choices) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | YES | NO | WD PROC | NET | COM GAM | E-MAIL | CHAT | NONE |
| 20-30 | 48 | 24 | 24 | 37 | 17 | 18 | 15 | 22 | 11 |
| 30-40 | 51 | 31 | 19 | 37 | 17 | 17 | 14 | 15 | 9 |
| 40-50 | 20 | 15 | 5 | 18 | 10 | 10 | 2 | 4 | 1 |
| 50-55 | 6 | 6 | 0 | 6 | 5 | 1 | 1 | 0 | 0 |

Only half (50 %) of those in the 20-30 group own a computer, while 31 (60.8 %) of the 30-40 age group have one. This contrasts rather unfavourably with the figures for the old age groups. However, it will be rather unjust to say that not owning a computer is likely to make the person 'anti-computer', without any further support.

It is also worth noting that the majority of teachers even without computers obviously have access to a computer, mostly likely in the school and claim knowledge of word processing. But word processing alone is clearly not enough, for computer literacy has to encompass the other uses like surfing the Internet, using e-mail for communication purposes and so on.

It is also obvious that unless there is on-going training available, the teachers may claim some knowledge but it may be limited to very specific functions like the preparation of examination papers (see interview data). Although 39 (31.2 %) have attended private classes for computer learning (see Table below), but it may be unwise to read more into this without testing the teachers' knowledge. A significantly high percentage (46.5%) of the females have attended private classes!

**TABLE 3: ACQUISITION OF COMPUTER SKILLS**

| AGE GROUP | NO | HOW COMP SKILLS ACQUIRED? | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | SELF | FRIENDS | COLLEAGUES | FAMILY | WORK | PRIVATE CLASSES | NONE |
| 20-30 | 48 | 17 | 22 | 17 | 9 | 10 | 21 | 1 |
| 30-40 | 51 | 20 | 23 | 21 | 11 | 14 | 13 | 4 |
| 40-50 | 20 | 9 | 6 | 13 | 7 | 3 | 5 | 1 |
| 50-55 | 6 | 1 | 0 | 1 | 4 | 0 | 0 | 0 |

### 3.1.2 Third Segment: Attitudes and Opinions

The vast majority think that computers are very important (76 %) or moderately important (19.2 %) in education. Surprising though, given today's world, is the fact that 2 people from the 40-50 age group think that computers have little to contribute to education. Consider what might happen if they were to assume senior positions in some school.

Doubts and fears related to computers seem to be generally confined to teaching others to use computers, perhaps due to the lack of exposure.

**TABLE 4: DOUBTS AND FEARS**

| AGE GROUP | NO | SELF | | LEARNING | | TEACHING | |
|---|---|---|---|---|---|---|---|
| | | YES | NO | YES | NO | YES | NO |
| 20-30 | 48 | 5 | 41 | | 45 | 8 | 37 |
| 30-40 | 51 | 7 | 44 | 2 | 45 | 13 | 30 |
| 40-50 | 20 | 6 | 13 | 4 | 13 | 6 | 11 |
| 50-55 | 6 | | 5 | | 5 | 2 | 4 |

It is also obvious that students were, for the most part, seen as having a positive attitude towards computers (see table below) and this is attested to by the 100% attendance reported on computer days (see data from interviews). Parents' response may be seen as less encouraging but, it was only a small percentage who see them as stumbling blocks. Asked how the computer literate people view the computer illiterate (not shown), most responded positively and this is again supported by teachers and pupils being able to work together (e.g. ex-students teaching teachers etc. obtained from the interviews).

**TABLE 5:  RESPONSE OF STUDENTS AND PARENTS**

| AGE GROUP | NO | STUDENTS' ATTITUDE | | PARENTS' ATTITUDE | | |
|---|---|---|---|---|---|---|
| | | P* | N | P | M | N |
| 20-30 | 48 | 41 | 5 | 18 | 21 | 7 |
| 30-40 | 51 | 46 | 1 | 19 | 27 | 4 |
| 40-50 | 20 | 17 | 1 | 5 | 15 | |
| 50-55 | 6 | 5 | | 3 | 3 | |

* P = Positive or Encouraging
N = Negative or Not Encouraging
M = Moderate or mid-range

### 3.1.4  Fourth Segment - School Management

This final segment of the questionnaire sought teachers' opinions on the general maintenance of  computers. It was clear where schools have the existing facilities, the responses were favourable. But where the schools had either very limited computer facilities or were about to start one, it was somewhat problematic – it was obvious that the responses related to a previous situation, or appeared confused. So the only conclusion to draw safely would be that it indicated a general awareness of what was

going on in relation to the available computer facilities and the availability of computer materials on the subjects they teach.

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## 3.2 INTERVIEWS WITH THE PRINCIPALS AND COMPUTER RESOURCE PERSON / TEACHERS

The data from the interviews were merged because of the overlap between the responses: otherwise it would have resulted in unnecessary repetition.

The summary below encompasses the views of five principals (four, male and one, female) and four resource persons and three computer teachers.

### 3.2.1 Computer Lab

Three of the schools had fully-equipped computer labs with as many as 50 computers (including a few for teachers to improve their computer skills) while two others were in the process of acquiring more computers or setting up their own computer lab. One school had even gone on to set up a multi-media lab.

### 3.2.2. Computer Teachers

The computer resource person in each of the schools is obviously trained and is generally responsible for the type of programmes run as well as the maintenance of the computer facilities.

Some have set up computer clubs after school hours or on Saturday. Ex-students also help out.

The teaching is conducted by computer teachers, usually one for the morning session and one for the afternoon session and his or her salary is paid by the Parent-Teacher Association. They are not part of the teaching staff of the school.

One school also utilises the services of former students. This has many positive implications: these students acquire leadership qualities by working with the current students: it keeps them occupied; it provides them with access to facilities they would otherwise lack etc.

However, the general teaching staff is not involved in actually conducting the classes even if the activity focus relates to their subject.

### 3.2.3 Computer classes

Where there are formal classes (as in three of the schools), they are conducted once a week and last one hour. Since there is no provision within the weekly schedule, these

computer classes are held during the officially-designated Moral, Physical Education or 'Waktu Guru Besar' hour or in one instance, after school.

There is a fear that this move may be misconstrued as time taken off from other subjects. Clearly the non-inclusion of computer classes within the official time-table appears to be not in line with the Government policy of incorporating computers as an educational tool. ( e.g. Smart Schools Project).

### 3.2.4 Programmes

The educational materials generally used in the computer classes are readily-available CD-Roms and/oror lessons downloaded from the Internet and/or internally prepared worksheets. Students also learn the basics about computers, such as mouse, CPU etc. Word Processing skills, even the use of Powerpoint etc (Microsoft Applications) are taught.

### 3.2.5 Internet

Internet access is available in some of the schools. In one school, students have internal e-mail accounts and use them to write to one another as part of the learning activities.

Access to certain websites are encouraged. There is little opportunity for misuse of the Internet facilities because of the close monitoring by the computer teachers.

But Internet connections impose additional expenses which smaller schools find hard to meet.

### 3.2.6 Students' Response

Computer classes generally record 100 % attendance, according to the computer teachers. This clearly indicates how popular they are. Even the academically poor are interested and never fail to attend class.

It is therefore sad that in schools where students have to pay and are unable to do so, they are deprived of something that almost certainly has a positive effort on them.

Moreover, students' work, which is of a high caliber, is displayed; so students are also highly motivated to improve on their skills.

### 3.2.7 Teachers' response

While the majority of the teaching staff are computer literate (compare with data from the questionnaire survey), it appears that new ones lack the skills but are motivated to learn word processing skills. The impetus comes from the fact that examination papers have to be typed using computers. (In one school, ex-students help teachers to pick up such skills.)

Of course, there are certain teachers who resist because of the fear that the Internet would result in students' being exposed to pornography through the Internet. This can be eradicated. However, there is another attitude that is more ingrained and damaging, that is, fear of more work if they are computer literate.

Although in some schools training is provided, it results in personal, individual gain only (not necessarily bad in itself). The general teaching staff is not directly involved in the computer classes. However, in most cases, usually teachers pick up skills themselves (see data from questionnaires).

### 3.2.8 Parents' response / PTA

By and large, the response from parents is highly favourable in their wanting their children to acquire computer skills. But, either because of poverty or misplaced priorities, their children may not benefit from the classes, especially if there is no provision for non-paying students (usually the smaller or poorer schools). These fees range from RM3 to RM10 per month.

Some schools engage in regular dialogue with the parents through the PTA meetings. Attendance in one school is further guaranteed by providing hampers or other forms of 'gifts' to entice the parents.

The PTA also has the unenviable task of paying for the computer teachers.

### 3.2.9 Funds

The schools are all dependent on fund-raising activities (such as jogathons, sale of T-shirts etc.) or generous donations from well-wishers to purchase the hardware and the requisite software and for the subsequent maintenance and repair works. Only one school was fortunate in being fully equipped by a prominent individual.

### 3.2.10 Future plans

Some schools, especially with the resources and encouragement are ambitious in expanding the computer facilities. They would like to better equip the existing labs with headsets for individual students and LCD projectors to teach Powerpoint applications etc. There is also enthusiasm for the development of relevant teaching materials or software because of the lack of suitable software in Tamil.

One school would like to teach programming and technical aspects such as trouble-shooting to students. Given the facilities, these do not appear to be pipe dreams, but achievable realities, especially when the school has gone on to set up a multi-media, self-access lab.

### 3.2.11 Role of Principals

It was clearly evident that without the good leadership of the respective principals, very little would have been achieved. The extrinsic motivation for teachers and students to acquire skills has, in most of the schools, come from the principals themselves. They have been the moving force behind the success of the computer labs.

In one or two schools, they have also seen the potential in keeping tabs on their former students by using them to help teach the present students, and also providing a means for them to continue improving their skills.

## 4. DISCUSSION

### 4.1 POSITIVE FACTORS

### 4.1.1 Role of Principals

In this context, principals undoubtedly play a crucial role in encouraging computer use (as seen in all schools) Their dedication and commitment clearly determines the success or failure of the computer project. This is demonstrated by the fact that the two schools that supposedly were without computers had gone ahead to rectify the situation. The future of computer use in Tamil schools is very much tied in with having visionary leadership

### 4.1.2 Role of Computer Resource Persons

Just like the principals, the Computer Resource Person plays a crucial, supporting role. He or she has to be dynamic and be aware of the ever-changing face of the computer lab. He or she has to work towards eradicating the negative elements that prevent maximum gains from the computer programmes, help enhance the existing programmes and be prepared to embrace and react positively to changes.

### 4.1.3 Role of Parents and the Community

At the present time, since schools are heavily dependent on contributions, parents and members of the community play a positive part and will continue, or have to continue, to do so in the near future. The non-defeatist attitude, in the face of minimal support from the government, is most encouraging.

### 4.1.4 Response of Students

Computer classes should become a part of the climate of primary schools, based on the current enthusiasm shown by students, especially in class attendance and their responsiveness in the computer classes. This should be translated into more and better use of computer facilities to teach the regular subjects.

### 4.1.5 Evolving Mind-set or Paradigm Shift

The enthusiasm of past students in volunteering their service and being willing to share knowledge and teach both teachers and students is bound to reap later benefits. So too is the willingness of teachers to learn from students.

### 4.2  NEGATIVE FACTORS

### 4.2.1 Lack of Government Support

Despite all the government plans for promoting computer literacy, little has filtered down to the Tamil primary schools in the form of funds, nor other form of tangible support. Tamil schools continue to remain the stepchild of the education system.

Neither is there provision for incorporating the teaching of computer skills in the regular weekly schedules.  Schools are given the option of  'borrowing' slots intended for other activities.

### 4.2.2 Dependency on Community Support

There is inevitably a high level of dependency on well-wishers and parents for contributions in different forms: computers, servers, a container, even sponsorship of students.  Activities to raise funds may actually be an unnecessary drain on the resources of the school, that is, teachers could be better engaged in giving remedial classes etc.

### 4.2.3 Resistance to Change

A certain amount of  resistance from particularly a few older teachers has been reported – for reasons highlighted earlier.  However, training and greater exposure could lead to a change in the mind set of such 'thinkers'.

### 4.2.4 Involvement of Teaching Staff

Computer classes are handled by trained computer teachers which results in a somewhat artificial separation, especially in relation to the teaching of languages or the other subjects. It may look like the best alternative at this point. But the computer teacher may not be the best person to handle the subject contents, especially when explanations are necessary.

### 4.3  RECOMMENDATIONS

By now it would be obvious  which direction the recommendations would take. These can be succinctly put as the need to:

1.　　　ensure that the right people are appointed to positions of authority, be it in the school administration sector, as principals of schools, or even as resource persons in schools.

2.　　　involve the regular teachers through the  provision of additional incentives to prepare proper teaching materials / software etc and also to conduct the classes themselves.  This would minimise reliance on outside teachers and also cut back on PTAs having to raise funds to pay the teachers.

3.　　　lobby the government for financial allocations for hardware, software, maintenance, training etc. and also to institute changes in the school curriculum to incorporate the teaching of computer skills as part of the primary school weekly schedule.

One additional recommendation is that in schools and in areas where the basic infrastructure like regular electricity supply is lacking,  Mobile Internet Units could be set up to provide the solution.  This could help schools without  resources.

## 5.  LIMITATIONS OF THE STUDY

This is a small scale project which was limited to five schools within an urban environment. Generalisability may be suspect, although not necessarily inapplicable. Further research, probably on a larger scale outside the KL/ Selangor area might throw up other factors.

Moreover,  questionnaires were administered as a tool to gauge the teaching staff's response. One shortcoming, as with most questionnaires, is the reliability of all the information provided and the possibility of questions being misinterpreted. To some extent, the researchers sought to control this by excluding suspect data.

## 6.  CONCLUSION

It is taken for granted that when it comes to technological advances in education, Tamil schools lag far behind the government-assisted schools and the other vernacular schools i.e. Chinese schools. This is generally true because they do not get funds from the government for the purchase of the requisite hardware. At the same time, the parent-student demographics is different from that of  the Chinese schools..

Despite this state of affairs, it is truly heartening to find there are success stories. A few Tamil schools have managed to set up computer centres  with either support from parents or sponsors. Some are starting small and trying not to be left behind in the computer age: all this without being dependent on the government.