

# Teachers' Technology Professional Development: A Malaysia Perspective

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**Abstract:** This paper centers on the impact of laptop use on the professional development of teachers. Three hundred and eighty six secondary school teachers from 28 selected schools participated in the survey. These teachers were currently teaching Science and Mathematics, and were provided laptop as part of the Teaching and Learning of Science and Mathematics in English, or better known by its Malay acronym PPSMI programme. Teachers' professional development was measured in three dimensions: teaching-learning, administrative practice and use of resources. The analysis revealed that the use of laptop has a moderate impact on the overall teachers' professional development.

**Keywords:** laptop, teacher, professional development, impact

## 1. Introduction

The Malaysia Ministry of Education (MoE) has been exploring ways to harness technology into the education system. Malaysia embarked on the laptop initiative program beginning from the year 2003, initially as part of the teaching and learning of Science and Mathematics in English (better known by its Malay acronym PPSMI) program [2, 3, 4]. Taking into considerations from the education level where science-based courses rely heavily on English dependent reference materials [2, 3, 5], and the emergence of technology driven world that needs the nation to engage efficiently and competitively in English, contributes to the change in the policy [3]. The launching of the program started with the change of medium of instruction of Science and Mathematics subjects from Bahasa Melayu to English. As part of the program, laptops were deployed to every Science and Mathematics teachers as an initiative to facilitate and enrich the teaching of both subject areas in English [2, 3, 5, 6]. They were also equipped with self-instructional learning materials inclusive of grammar books, dictionaries and CD-ROM as a means for teachers to develop their own instructional toolkit and own resources for continuous professional development [2, 3]. Advocates and practitioners strongly believe that the integration of ICT in teaching-learning primarily through laptops is, for all intents and purposes, beneficial for the teachers and students.

## 2. Methodology

A survey was carried out among 386 secondary school teachers who were teaching Science and Mathematics subjects in school with the aid of laptops. A set of questionnaire with five-fold Likert categorization with a continuum of strongly agree (SA), agree (A), neutral (N), disagree (D), strongly disagree (SD); was designed by the researchers based on the review of related literature and previous studies [8, 9]. The Cronbach alpha coefficient value obtained was high [10, 11, 12], namely .925.

## Results and Discussion

There were 79 males and 307 females participated in the survey. They reported spending an average of 4.55 hours (S.D. = 2.46) per day using the laptop. They have a range of less than a year to 32 years of teaching experience (M = 10.41; SD = 8.48). The impact of laptop use on teachers' professional development was measured in terms of three dimensions namely teaching-learning, administrative practice and use of resources.

### 2.1 Teaching-Learning

These findings outlined the impact of the initiative on the teaching-learning process. Three items were above the overall mean (3.80). Item number 1 had the highest mean score of 4.28 (S.D.=0.75), followed by item number 5 with a mean score of 4.06 (S.D.=0.87). The negative item (Item 3) had the third highest mean (M=3.92; S.D.=0.88). The item number 4 scored the lowest among all the items (M=3.05; S.D.=1.02).

Table 1

*Percentages, Means and Standard Deviations for Items on Teaching-Learning*

| Items                                                                                                                           | SD<br>%<br>(f) | D<br>%<br>(f) | N<br>%<br>(f) | A<br>%<br>(f) | SA<br>%<br>(f) | Mean | SD   |
|---------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|---------------|---------------|----------------|------|------|
| 1. I feel using the laptop benefits my teaching.                                                                                | 0.5<br>(2)     | 3.1<br>(12)   | 5.4<br>(21)   | 49.7<br>(192) | 41.2<br>(159)  | 4.28 | 0.75 |
| 2. The use of laptop in the teaching-learning process saves time.                                                               | 1.8<br>(7)     | 17.1<br>(66)  | 14.8<br>(57)  | 40.9<br>(158) | 25.4<br>(98)   | 3.71 | 1.08 |
| 3. * The presence of laptop in my classroom is disruptive to my teaching.                                                       | 25.4<br>(98)   | 49.5<br>(191) | 17.4<br>(67)  | 7.0<br>(27)   | .8<br>(3)      | 3.92 | .88  |
| 4. * I can teach better without the help of a laptop.                                                                           | 7.0<br>(27)    | 22.3<br>(86)  | 35.8<br>(138) | 29.0<br>(112) | 6.0<br>(23)    | 3.05 | 1.02 |
| 5. I can explain something more effectively to my students with the aid of a laptop used in conjunction with the LCD projector. | 0.8<br>(3)     | 5.7<br>(22)   | 13.5<br>(52)  | 46.9<br>(181) | 33.2<br>(128)  | 4.06 | 0.87 |

Mean of means=3.80

\*negative item

### 2.2 Administrative Practices

This dimension deals with the impact of laptop use on the administrative practice of the teachers. Six items in Table 2 were above the overall mean (3.93). Item number 11 had

the highest mean score 4.26 (S.D.=0.82), followed by item number 2 (M=4.21; S.D.=0.71). Item number 4 had the lowest mean score among all the items (M=3.55; S.D.=1.14) while the second lowest was from item 7, which was the negative item (M=3.56; S.D.=1.5).

Table 2

*Percentages, Means and Standard Deviations for Items on Administrative Practices*

| Items                                                                                  | SD<br>%<br>(f) | D<br>%<br>(f) | N<br>%<br>(f) | A<br>%<br>(f) | SA<br>%<br>(f) | Mean | SD   |
|----------------------------------------------------------------------------------------|----------------|---------------|---------------|---------------|----------------|------|------|
| 1. I can complete my work in a shorter time because I can take work home in my laptop. | 35.5<br>(137)  | 48.7<br>(188) | 9.8<br>(38)   | 4.4<br>(17)   | 1.6<br>(6)     | 4.12 | 0.87 |
| 2. Having a laptop helps me to be better organized in my work.                         | 34.2<br>(132)  | 55.7<br>(215) | 7.3<br>(28)   | 2.6<br>(10)   | 1.6<br>(3)     | 4.21 | 0.71 |
| 3. I key-in examination marks on spreadsheets using the laptop.                        | 2.4<br>(9)     | 12.4<br>(48)  | 13.5<br>(52)  | 40.7<br>(157) | 31.1<br>(120)  | 3.88 | 1.12 |
| 4. I calculate the examination marks on spreadsheets using the laptop.                 | 3.9<br>(15)    | 18.7<br>(72)  | 18.1<br>(70)  | 37.0<br>(143) | 22.3<br>(86)   | 3.55 | 1.14 |
| 5. I analyse the examination marks on spreadsheets using the laptop.                   | 3.4<br>(13)    | 13.0<br>(50)  | 16.3<br>(63)  | 43.5<br>(168) | 23.8<br>(92)   | 3.72 | 1.07 |
| 6. The quality of my work has improved since I received a laptop.                      | 0.3<br>(1)     | 3.9<br>(15)   | 19.2<br>(74)  | 55.4<br>(214) | 21.2<br>(82)   | 3.94 | 0.76 |
| 7. * Using the laptop has increased my workload.                                       | 4.1<br>(16)    | 12.7<br>(49)  | 23.1<br>(89)  | 42.7<br>(165) | 17.4<br>(67)   | 3.56 | 1.05 |
| 8. Laptop is a vital tool for recording assessment data.                               | 0.5<br>(2)     | 4.9<br>(19)   | 9.3<br>(36)   | 51.0<br>(197) | 34.2<br>(132)  | 4.13 | 0.81 |
| 9. I use the laptop to store students' information.                                    | 0.5<br>(2)     | 6.5<br>(25)   | 11.4<br>(44)  | 49.7<br>(192) | 31.9<br>(123)  | 4.06 | 0.86 |
| 10. Having a laptop has improved my efficiency in class management.                    | 0.5<br>(2)     | 8.3<br>(32)   | 20.2<br>(78)  | 51.6<br>(199) | 19.4<br>(75)   | 3.81 | 0.86 |
| 11. I use the laptop to create examination sheets or worksheets.                       | 1.0<br>(4)     | 3.9<br>(15)   | 6.0<br>(23)   | 46.6<br>(180) | 42.5<br>(164)  | 4.26 | 0.82 |

Mean of means=3.93

\* negative item

### 2.3 Use of Resources

Table 3 shows the findings of the impact of laptop use on teachers' use of resources. Five items with scores above the mean (3.75). Item number 1 scored the highest among all (M=4.13; S.D.=0.80). The lowest mean score (M=3.41, S.D.=1.13) was from item 6 (S.D.=1.13). This may be due to the lack of Internet access at some of the teachers' residence, or teachers do not use their laptop with the Internet while at home.

Table 3

*Percentages, Means and Standard Deviations for Items on Use of Resources*

| Items                                                                             | SD<br>%<br>(f) | D<br>%<br>(f) | N<br>%<br>(f) | A<br>%<br>(f) | SA<br>%<br>(f) | Mean | SD   |
|-----------------------------------------------------------------------------------|----------------|---------------|---------------|---------------|----------------|------|------|
| 1. Having a laptop has helped me to obtain access to more up-to-date information. | 0.80<br>(3)    | 3.9<br>(15)   | 10.1<br>(39)  | 51.8<br>(200) | 33.4<br>(129)  | 4.13 | 0.80 |

|    |                                                                                                    |             |              |               |               |               |      |      |
|----|----------------------------------------------------------------------------------------------------|-------------|--------------|---------------|---------------|---------------|------|------|
| 2. | With the laptop, I have the freedom to access the Internet anywhere I like.                        | 2.3<br>(9)  | 11.9<br>(46) | 19.2<br>(74)  | 40.9<br>(158) | 25.6<br>(99)  | 3.76 | 1.04 |
| 3. | Having a laptop enables me to surf websites to search for relevant information.                    | 2.1<br>(8)  | 6.2<br>(24)  | 12.4<br>(48)  | 51.0<br>(197) | 28.2<br>(109) | 3.97 | 0.92 |
| 4. | I often use the Internet with the laptop to enhance my teaching.                                   | 1.0<br>(4)  | 17.1<br>(66) | 29.0<br>(112) | 40.2<br>(155) | 12.7<br>(49)  | 3.46 | 0.95 |
| 5. | Having a laptop enables me to experiment with new software at home.                                | 2.3<br>(9)  | 11.9<br>(46) | 17.9<br>(69)  | 49.2<br>(190) | 18.7<br>(72)  | 3.7  | 0.98 |
| 6. | I use my laptop to obtain access to the Internet at home.                                          | 4.7<br>(18) | 20.7<br>(80) | 21.2<br>(82)  | 36.0<br>(139) | 17.4<br>(67)  | 3.41 | 1.13 |
| 7. | Having a laptop has given me the access to a greater range of teaching resources than ever before. | 0.80<br>(3) | 4.7<br>(18)  | 15.3<br>(59)  | 58.3<br>(225) | 21.0<br>(81)  | 3.94 | 0.79 |
| 8. | I can download documents from the Internet now that I have a laptop.                               | 1.3<br>(5)  | 10.4<br>(40) | 16.3<br>(63)  | 46.4<br>(179) | 25.6<br>(99)  | 3.85 | 0.96 |
| 9. | With a laptop, I intend to purchase educational electronic resources (e.g.: CD, VCD and DVD).      | 3.7<br>(14) | 11.1<br>(43) | 25.1<br>(97)  | 46.1<br>(178) | 14.0<br>(54)  | 3.55 | 0.99 |

Mean of means=3.75

#### 2.4 Levels of Laptop Impact on Teachers' Professional Development

Professional development was categorized into three levels: low, moderate and high; according to the 25<sup>th</sup>, 50<sup>th</sup> and 75<sup>th</sup> percentile. Cumulative scores that fall below the 25<sup>th</sup> percentile is categorized as having a low impact, between 25<sup>th</sup> and 75<sup>th</sup> percentile as moderate impact and above the 75<sup>th</sup> percentile as high impact. Table 4 portrays that the percentages of teachers who perceived that laptop has a moderate and high impact on their teaching-learning process was almost equal (35.2% and 34.7% each). Almost a majority of them (47.4%) indicate that the laptop impact on their administrative practices was moderate. In terms of resources, nearly half of the teachers (46.9%) confirmed the impact of the laptop was moderate on their use of resources.

Table 4  
*Levels of Laptop Impact on Teachers' Professional Development*

| Dimension                               | Low<br>%<br>(f)       | Moderate<br>%<br>(f)  | High<br>%<br>(f)     | Mean        | SD         |
|-----------------------------------------|-----------------------|-----------------------|----------------------|-------------|------------|
| Teaching-Learning                       | 30.1<br>(116)         | 35.2<br>(136)         | 34.7<br>(134)        | 3.80        | .67        |
| Administrative Practices                | 25.6<br>(99)          | 47.4<br>(183)         | 26.9<br>(104)        | 3.93        | .61        |
| Use of Resources                        | 27.5<br>(106)         | 46.9<br>(181)         | 25.6<br>(99)         | 3.75        | .69        |
| <b>Overall Professional Development</b> | <b>26.4<br/>(102)</b> | <b>48.7<br/>(188)</b> | <b>24.9<br/>(96)</b> | <b>3.68</b> | <b>.47</b> |

Mean of means=3.68

On the whole, almost half of the school teachers (48.7%) indicated that laptop has a moderate impact on their overall professional development. All three dimensions scored above the mean (3.68).

### 3. Conclusion

Teachers of this study were found to have experienced a positive, moderate impact of laptop on their professional growth. The use of laptop during teaching-learning has helped teachers improve their classroom instruction. Moreover, the portable technology was also actively used for other tasks such as administrative practices. Additionally, the laptop has helped improved teachers' quality of work and their efficiency in class management. Teachers regard laptop as a vital tool for recording students' record as it allows storage for large amounts of data such as the students' information and the assessment marks. Even though the findings reported a moderate level of laptop impact, it can be assumed that teachers are now beginning to accept and assimilate their daily practices with the help of laptops.

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