



## Support for Science and Mathematics Teachers in The Implementation of PPSMI: Challenges Ahead and Strategies to Sustain The Momentum

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### **ABSTRACT**

*Teacher readiness is recognized as most critical in assuring the success and effectiveness in the implementation of teaching science and mathematics in English. Several external factors can enhance or hinder teachers' capacity towards achieving the goals of PPSMI. Various strategies were implemented to prepare teachers and help them in making the transition. The roll out of PPSMI in Form 2 and Year 2 in 2004 brings new and probably bigger challenges. Additional efforts must be taken to reduce friction and to provide sufficient energy for the teachers to overcome the challenges ahead. This paper identifies some of the challenges coming with the new big wave. It will also suggest strategies which can be considered and implemented in schools to support the teachers.*

### **Introduction**

The rollout of PPSMI to Form 2 and Year 2 in 2004 will bring about new and probably bigger challenges. Additional support, beyond the existing effort provided by various agencies, must be undertaken to help teachers cope with constraints as well as provide sufficient impetus for teachers to overcome the challenges ahead. This paper identifies some of the challenges that will arise with the new wave. Some strategies are proposed which can be considered with a view to implement in school.

### **The Next Wave**

Beginning 2004, PPSMI will be implemented in Year 2 and Form 2. Teachers who have been teaching PPSMI classes in 2003 will most likely continue teaching the Year 1 and Form 1 classes. Instead, a new set of PPSMI teachers will teach the Year 2 and Form 2 classes.



The students in Year 2 and Form 2 can be expected to have improved their English language since they have undergone PPSMI in 2003. They would have been familiar with common phrases used in instruction and questions, or at least they would have been exposed to some scientific and mathematics terms in English. Likewise, teachers in Year 1 and Form 1 would be more confident and able to improve the teaching and learning in future PPSMI classes. Similarly, the school curriculum committee would have some knowledge and a better understanding of the demands of PPSMI classes so that the school is better prepared to implement a more effective strategy in 2004.

However, the rollout of PPSMI to Year 2 and Form 2 in this coming January 2004 should not be expected to be less of a challenge. In fact the new wave will bring new demands and perhaps a little extra load. Thus, the implementation cannot be assumed to be smooth or that teachers continue to operate on existing momentum. In order to ensure effective implementation, additional impetus and support must be provided.

### **The Challenges Ahead**

#### **i. Demand for higher level of language in Form 2**

Teaching and learning in Year 1 and Form 1 does not require the use of complex sentences. The curriculum is simple and the topic involves the teaching of things, which are common and easily visualized by students. Teachers can deliver content by using key words, graphics and body language. Use of long sentences is minimized for example when giving instructions, asking questions and providing answers.

At a higher level, it is to be expected that the curriculum content will become increasingly complex. It demands a higher level of English proficiency among teachers and students. To be able to understand the content, therefore, students must have already possessed some minimum ability in the English language.

The new task for the PPSMI teachers is that they need to recognize students' language ability when strategizing a lesson plan. It is a common belief that teachers should consider delivering lessons based on students' ability. Besides content, students' language proficiency should also be considered. In some cases, it's not unusual to find students who need special helps from the teachers because of their language handicap.



ii. English proficiency among teachers

It cannot be assumed that English proficiency of all science and mathematics teachers in Year 2 and Form 2 in 2003 are at equal level. In many cases, the respective science and mathematic teachers were identified to teach in Year 1 and Form 1 in 2003 simply because these teachers were more prepared to teach in English. Even though the new batch of PPSMI teachers had some time to improve their language and have been given sufficient training in 2003, this alone cannot guarantee that they are as confident as the previous cohort. These teachers would face a bigger task in delivering lessons in English effectively.

iii. Students' ability in science and mathematics

Knowledge obtained by students in Year 1 and Form 1 is critical. This becomes the very foundation upon which they develop understanding of other new concepts. In this respect teachers may have to deal with the reality that some students are lacking in certain skills and basic knowledge due to some shortcomings in the previous year.

iv. Financial Support

A 'launching grant' between RM 6,000 to RM 10,000 was set aside for each school in 2002. The aim was to help schools in making preparations to implement PPSMI according to their respective needs. Schools made use of the fund for various PPSMI activities in 2003. This is a 'one-off allocation, no additional funds will be sent in the Year 2004 to fulfil new needs. Schools and teachers who require additional funds for the operation of PPSMI in 2004 will have to get them from other channels.

v. Resources

Several different types of teaching and learning materials in the form of books, CDs, web-sites as well as TV programs are made available in schools. Schools have been informed that these resources are provided as one-off and that they are fully responsible in managing these materials. The new group of teachers will have the task to find out what is available, where it is available, why they are useful and how to use them. With poor management of resources, the subsequent users may find some materials damaged or untraceable.



vi. Support from school heads and other teachers

Continuous support from school heads and other teachers have contributed a lot towards the smooth implementation of PPSMI. Their focus on this project will be divided when other new programs or issues in school also demand equal attention. The result of which is that teachers are being left alone when they face difficulties and criticisms. Indeed implementation in the first year needed the full support from the school heads to drive the program and to help solve any problem arisen. But demands and expectations from various stakeholders will also increase with time. Thus with higher demands, teachers will have the daunting task to show rapid improvement and produce results in the implementation of PPSMI.

**Some Suggested Solutions**

i. Enhancement of English programs in school

Most schools have implemented various programs to improve English in school either through curriculum or co-curricular activities. Creating an English-speaking environment is generally seen as crucial towards enhancing the use of English within the school community. These programs should be expanded further so as to enable English to be used in assembly, meetings, talks, publications, and in making announcements.

ii. Science context in English lesson

English teachers should play some roles to reduce language barriers in the teaching of science and mathematics. One approach is the use of science contexts in English lessons. This strategy should be practiced by all English teachers in their classes. Such effort would allow students to be familiar with science and mathematics terms or phrases commonly used in instructions, questions or content. It would provide some space for the science and mathematic teachers to concentrate on the content instead of the language. Collaboration between science and English teachers would be useful to develop lessons on an agreed context.

iii. Remedial classes

Teachers who have not been able to finish the syllabus in Year 1 and Form 1 should take the initiative to carry out remedial classes for the underachieving students. Delaying the effort would magnify students' difficulties further as they progress to other levels.



iv. Teachers Colloquium

Teachers need to be given some space and freedom to operate, but at the same time they cannot be left alone. Continuous support including guidance and advice will be useful. They need opportunities to share information, which they are entitled to, and other information, which can help them in their teaching and learning. Among others they need to be briefed on the use of ICT, teaching courseware, new methods of teaching and learning, and use of other resources. Seminars and discussions among teachers at district level will also be very useful and effective to this task.

V. PPSMI Resource Centre

The PPSMI resource room provides a conducive environment for teachers to discuss with other PPSM1 teachers and to prepare lesson plans. It is not only the centre to keep PPSMI resources, but it becomes the meeting place for science, mathematics and English teachers. In some schools, the atmosphere in the room encourages teachers to speak in English that they find it difficult to use in the staff room. The close interaction of Maths and Science teachers with English teachers will make the 'buddy system' more efficient in improving the English proficiency among the science and mathematics teachers. It enhances collaborations between the PPSMI teachers in developing lesson plans.

vi. Early preparation for teachers

School should begin early teacher preparation by organizing English courses for all teachers. Mathematics and science teachers in non-PPSMI classes should also be encouraged to use English in teaching and learning. At least they would start using some common English terms or phrases in the classroom. The use of relevant teaching and learning materials in English such as posters, the teaching courseware and materials from the Internet will be useful.

Pupils should also be encouraged to access to materials from the Internet that are predominantly in English. Sharing of these information with the teachers and class would indirectly expose teachers to the use of English language and this certainly help them in improving their language.



vii. Use of simple and clear English in classroom

Teachers should continuously be made to believe that the use of simple English and the clarity of message rather than style are meaningful in the process of teaching and learning. Videotapes of lessons conducted by English native speakers can generate belief and interest among teachers. English courses should not only train teachers in the use of simple sentences, but also to show how English native speakers use simple sentences in classroom.

viii. Content development

Production of one's own teaching and learning materials is one means that provides an environment that can encourage teachers to read and write. Although it is time consuming, the benefits however, are tremendous. Besides improving their language and ICT skills, teachers are indeed more comfortable in using their own teaching and learning materials in the classroom.

Simple basic software such as Power Point and MS Words are easily learnt. With the availability of ICT in schools, the development of materials is made easier and most probably without much added cost. Teachers can use arts; designs as well spelling, grammar and language check which are already available in the software. Through the materials accessed from the Internet, teachers would find a lot of contents that are relevant. Teachers can easily download images, which would make the lesson interesting and real. Indirectly, teachers read, write, expand their knowledge, and continuously correct their own English.

ix. ICT training

The thrills of having computer notebooks will be lost if the application is limited to the use of teaching courseware. Instead, teachers should continuously expand their ICT skills to a higher level where they can optimise the use of the equipment. It is true that basic ICT skills such as the use of MS Office such as MS Word, Power Point, and Excel is sufficient, but teachers would find the thrill and further benefit when they explore other applications.

Schools should not wait for training to be provided by the central agency. More effective training can be obtained locally. Teachers also cannot be expected to take their own initiatives to undergo such courses. Schools or PPDs can organize short ICT workshops regularly for teachers.



X. Resource management

There must be proper management of the resources that are made available in school. Available materials must be listed and be made known. A brief write-up will provide information of the content and usefulness of the respective materials. School management should also monitor the management of these resources including its usage.

xi. Internal monitoring and support

School heads should continuously provide motivation, support and advise to the teachers. Discussions with teachers allow teachers to share their difficulties. Observation of teaching and learning process by other teachers or school head should be carried out periodically. This would allow the second party to give constructive views to the respective teachers towards making the teaching and learning process more effective.

**Conclusion**

New and bigger challenges must be expected ahead. Strategies to help teachers must be applied in advance. Such effort can help to prevent emerging problem and provide additional energy for the teachers.