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Author(s)	Vanithamani Saravanan
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## **TEACHING & LEARNING IN A SINGAPORE PRIMARY SCHOOL: INTEGRATED PROJECT WORK**

Vanithamani Saravanan  
National Institute of Education  
Nanyang Technological University  
Singapore

**Will the IPW approach change learning styles, in teaching and learning?  
Will use of computers change modes of pupil learning and, if so, in what ways?**

### **Introduction: Curriculum Review Committee, 1997**

The review committee was set up in 1997 in Singapore to review the learning styles of students, teaching methodology and methods of curriculum assessment in Singapore schools. This arose from several educational concerns that were related to teaching and learning. In some classes the reliance was on content learning through rote memory, while in others there was the common practice of model answers and exercises to drill pupils as preparation for end of year examinations. One of the recommendations of the Review Committee was to introduce **Integrated Project Work (IPW)**:

- (i) in order to make teaching and learning communicative
- (ii) to encourage innovative & interactive approaches
- (iii) introduce inter-disciplinary project work would enable students to work on content areas of their curriculum in science, mathematics and English language
- (iv) to cultivate social responsibility through role-playing and peer/group sharing activities.

### **Recommendations of the Curriculum Review Committee**

A Curriculum Review Committee was set up in 1997 to review the learning styles of students, teaching methodology and methods of curriculum assessment. This arose from several educational concerns that were related to teaching and learning. Learners are reduced to passive recipients of rote learning routines. The pedagogy of teaching and feedback is often reduced to teachers marking mainly workbooks/ worksheets with little time for creative teaching or in the training of learning strategies.

The tendency is to over- teach and provide explicit training to predict or arrive at one correct answer. There is little room for flexibility in approaches, and the constraints of time and the tendency to want to cover a large amount of content area in rigid structured ways of teaching leads to less creative approaches. Children tend to develop an aversion to extensive reading as daily homework becomes a chore and a grind. There's little room for recreational reading, reading for interest – that goes beyond highly structured worksheets and notes in textbooks.

One of the recommendations of the Review Committee was to introduce Integrated Project Work (IPW). The Ministry of Education headed the training programme for teachers to be inducted into teaching IPW. The aims & objectives of project work were to make students resourceful, communicative and innovative via group/team work using interactive approaches. There was recommendation for inter-disciplinary project work where students were encouraged to read up on content areas of their curriculum in science, mathematics and English language.

One of the goals was to cultivate social responsibility through peer/group sharing activities and role-playing for pupils. There was to be some measure of self-directed learning with students looking up resources such as reference materials and the use of the Internet.

## Methodology of Integrated Project Work (IPW)

### *Training teachers and pupils on IPW*

#### **Weekly instructions**

English language, mathematics, and science teachers took turns at providing weekly instructions and reviewing progress of work. Teachers were trained using a set of MOE guidelines on the instruction of IPW. The IPW approach is now a compulsory part of integrated curriculum activities. Three teachers who were already teaching the primary three classrooms were teamed up – the English language, mathematics, and science teachers and they took turns at providing weekly instructions and reviewing progress of work.

#### **Role-play**

Pupils wrote up ‘scripts’ on the function of the roles they were expected to play and this was reviewed by the teacher to make sure that pupils not only understood the roles but were also able to make links within their learning tasks. Pupils were put into groups and training was provided on group roles such as: ‘leader’, ‘questioner’, ‘encourager’, ‘recorder’, and ‘time keeper’.

#### **Cooperative learning methods**

Kagan in Kagan *Resources For Teachers* (1992, 1994), David W. Johnson & Roger T. Johnson, (*Learning Together and Alone* 1991, 1994) discuss the benefits of learning together and alone, of cooperative, competitive, and individualistic learning. Shlomo Sharan in the *Handbook of Cooperative Learning Methods* (1994) talks about the need for less bureaucratic organization of the school, through its various mechanisms of administrative control.

In the current study, IPW interactive class sessions were selected as IPW fitted in with the curriculum requirements of integrating English, mathematics and science. Classroom observations of IPW sessions were conducted and recorded during the months of July, August, 2002. Thirty-one Primary 4 pupils were put into teams of 5 groups, each group with 4 pupils. Pupils were assigned roles and trained in roles to carry out their planning and preparation of science projects based on the given topic of ‘plants and their growth’. After the initial period of planning and preparation the pupils worked in the computer lab preparing their power point slides.

After five sessions of observations both in the classroom and in the computer lab they were eager to get started on IPW. During all the sessions pupils asked for help with the software, spelling of words such as ‘bibliography’. Pupils’ notes given by teachers referred to ‘bibliography’ as ‘where you referred to for your notes on topics’.

#### **IPW work schedule**

The Ministry of Education had recommended that IPW training should take place in primary 3 and primary 5 classes. The IPW work schedule was drawn up for term 2 and term 3 with a set of guidelines from the Ministry of Education. Six periods of approximately two and half hours per week were set aside for IPW during designated weeks. A team of teachers then produced a set of standardised set of guidelines for teachers. The standardized guidelines were decided upon after a year of trialling out the guidelines. This was to avoid too much variation amongst teachers and classes. The schools also decided that all IPW instruction and preparation should take place during school curriculum time. This was to ensure authenticity of the work put in by the pupils and to avoid the criticism that parents get involved in IPW. But teachers did note that some groups were motivated to use their free time to work on their projects after school time (but within the school premises).

A set of guidelines on ‘How to guide your pupils’, and another on group roles was also written up to assist the teachers with the training programme. A worksheet on ‘7 steps to carry out a project’, with the following sections: on getting started, ‘choosing a project, gathering information, gathering data, interpreting

information, presenting findings and reflecting and evaluating' the group projects was also provided. This was used to help pupils develop their roles in various aspects of the project (based on Kagan ,1992,1994).

Pupils were then briefed on IPW and teams were formed and logbooks were given out with roles assigned: leaders, recorders, etc. The form teacher grouped them in terms of mixed ability as well as mixed ethnic groups to make sure some of the guiding educational principles of the school were met.

### **Individual accountability**

Cooperative learning methods are high in individual accountability of group members to their group mates. This is more likely to produce greater learning than control methods that are low in individual accountability.

Pupils wrote up 'scripts' on the function of the roles they were expected to play and this was reviewed by the teacher to make sure that pupils not only understood the roles but were also able to make links within their learning tasks. For example, Sabrina who was trained under the role of a leader wrote up the following: '*when I am with my group, as a leader I do the following---*'; Gregory was trained as a reporter: '*when I take notes, I write down---*'; Hui Ru was trained as a questioner, '*when I am not sure, I raise my hand and ---*'; Jie Xiang was trained as an observer under '*when I am not sure, I raise my hand and ---*', Nur Amirah as encourager with '*when my friend's ideas are interesting, I say ---, when my friend keeps quiet, I ---*'. Some of these captions for roles had helpful responses so that weaker pupils who were confident in language were not lost for words and that helped to prevent a total breakdown in communication amongst the various group members.

The purpose of the base group is to give the support, encouragement, and assistance each member needs to consistently work hard in school, make academic progress (attend class, complete all assignments, learn), and develop cognitively and socially in healthy ways. ((David W. Johnson & Roger T. Johnson, 1994, 1991, Cooperative learning scripts.). Learning together and alone: cooperative, competitive, and individualistic learning is referred to by Allyn & Bacon. This is true of regardless of individual differences in ability level, sex, handicapping conditions, ethnic membership, social class differences, or task orientation.

Cooperative learning methods high in individual accountability of group members to their group mates are much more likely to produce greater learning than control methods that are low in individual accountability. The mathematics teacher was assigned to train pupils to decide on the use of simple statistical information as well as charts etc the science teacher briefed pupils on science topics for the projects with a follow up on content knowledge on scientific concepts.

## **IPW and co-operative learning Outcomes**

### **Peer acknowledgement and assessment**

One of the most positive outcomes recorded by researchers is academic gains for minority and low achieving students. Primary 3B pupils in the study whose learning ability was considered average showed that they looked forward to the planning and preparation of their project lessons in the computer lab. When asked why they wanted to do well the pupils said that this was because they were presenting to their class. It turned out that presenting to their class members was far more important than presenting to their teacher. Peer acknowledgement and assessment was an important aspect of their desire to learn well (cf Male,1994). George Jacobs and Loh Wan In, *Teaching Large Classes*, 2003).

Kagan, 1992,1994 states that one of the most positive outcomes are academic gains for minority and low achieving students, improved race-relations among integrated classrooms, and improved social and affective development among all students. There is also evidence that cooperative learning has a positive impact on classroom climate as children tended not to absent themselves, there was almost full attendance for all the sessions, and persuaded me to take charge when their form teacher was on medical leave. They showed a great keenness and willingness to take charge of their learning

## **Discussion on Learning Styles**

Primary 3B pupils said largely to be of average ability showed that they looked forward to the planning and preparation of their project lessons in the computer lab. There was greater motivation in using the computer as a tool for learning as there was always an air of expectation when the teacher designated certain days as planning days in the computer labs. Pupils gave themselves their own group names and below are some of their comments on IPW.

### Fantastic Four (leader: Nur Aquila)

Fantastic Four wanted to get A\*. Part of the reason as one pupil put it was to avoid being caned at home, “*My mother expects me to get an A\**”. They liked to work hard as they ‘*found the computer interesting*’ and they liked to use computers because they liked to type.

### Co-operative Four (leader: Rashyad)

This group preferred to use the computer as ‘*writing is tiring*’ they complained. They showed a sense of wanting to progress on their project.

### Fascinating Four (leader: Sabrina)

The group found using computers more ‘*interesting when compared to other sources like the encyclopaedia and books in the library*’. They said they learned more through the Internet. They found the Internet was more informative, as it gives text with ‘*pictures and animation*’.

### Power of Five (leader: Ong Hui Ling)

This group stated that they preferred to prepare power point slides as they liked to type and found writing on paper a chore.

### Imaginative Four (leader: Nur Amirah)

They believed that their name matched themselves. They did their research from library books and their leader Nur Amirah took the initiative to borrow them. tasks were shared, eg There was greater motivation in using the computer as a tool for learning as there was always an air of expectation when the teacher designated certain days as planning days in the computer labs.

Pupils had to apply and transfer the information on their selected science topics to the selected projects. They had to use references and search tools, look up books in their school library, use the internet search tools to download texts, visuals, animation with sounds. Pupils experienced, perhaps for the first time, a sense of independent learning.

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