

## CHAPTER FIVE -DISCUSSION AND CONCLUSIONS

### RESEARCH QUESTION 1: BENEFITS OF COLLABORATION IN NETWORKED CLASSROOMS

**RQ 1 (i) Did collaboration in networked classrooms create a supportive learning environment for writing by increasing awareness of audience through attempts to elaborate ideas?**

Collaboration in networked classrooms enabled the students to communicate with real-life audiences. Playing the role of reader to the feedback from collaborative partners and the role of writer in furthering communication, the writer had the advantage of assessing the audience's knowledge and expectations. Thus, the students were in a better position to assess what and how much the other party knew as well as what the other party would feel about a particular matter being discussed.

This concurs with Hughey et al.'s (1983) creative model process of writing where the writer identifies any gaps in understanding between what he is attempting to express and what the reader understands. The Malaysian students identified points where added clarity in communication was needed. When the French students expressed doubts about the role-playing game, the Malaysian students were able to assess that the reader, their French counterparts, were not able to visualise the role-playing game at all. Therefore, to aid and enhance their counterparts' understanding, the Malaysian students provided detailed examples to explain the role-playing game. In addition, they suggested how the initial proposals of writing a letter to the

editor, comparison of water test results, articles, riddles and puzzles on water pollution could be modified and incorporated into the role-playing game.

In conclusion, being more aware of the needs of the audience resulted in a clearer presentation of ideas and therefore, more effective communication. They did not merely recall and elaborate what they knew, a problem identified during the 1119/1322 (1995) English briefing. In contrast, the students identified communication needs and addressed these points.

This finding is supported by Tourchin's (1995) review of the benefits in using the Internet for collaborative learning. She found that students explored and discovered what they wanted to communicate, asked questions, identified problems, led the conversation where appropriate and took part in setting their objectives, standards and evaluations. Interacting actively with one another, the students were more aware of the importance of communicating effectively to the reader/audience. Hence, the opportunity to collaborate increased awareness of the writer-reader relationship and promoted critical thinking and problem solving skills in attempts to communicate clearly.

**RQ 1 (ii) Did collaboration in networked classrooms create a supportive learning environment for writing by increasing awareness of audience through clarification of ideas due to cultural differences?**

The opportunity to clarify ideas resulted in the creation of a glossary. Since the French students had difficulty understanding Bahasa Malaysia words and vice versa, creating a glossary of the foreign words used by all three

schools was proposed. It was hoped that having a glossary would help the reader to transcend cultural and geographical differences and therefore enable him to enjoy playing the game.

**RQ 1 (iii) Did collaboration in networked classrooms create a supportive learning environment for writing by increasing awareness of audience through requests for clarification when in doubt?**

Computer-mediated communication provided the writer with opportunities to clarify. When the French students requested for further clarification regarding the nature of the role-playing game, the Malaysian counterparts provided an analogy to a game familiar to most teenagers, Dungeons and Dragon's. They also created sample web pages so that their counterparts could play the game and therefore understand how it worked.

The Malaysian students requested for clarification regarding the manner in which the proposals from the three schools would be integrated. This provided an avenue for them to express their doubts and therefore promote opportunities for communication that was purposeful and meaningful in solving the problem at hand, i.e. to explain how integration could take place.

In short, the dynamic interaction and active interweaving of ideas mentioned by Ellington (1995) and Facione and Facione (1990) promoted the construction and reconstruction of the students' own understanding of the matter being communicated. They had to formulate, share and refine their ideas. In the process, thinking skills were honed as the students had to identify areas that needed more clarification and means of effecting this

clarification. Therefore, the resulting role-playing game showed cohesion and coherence as planning and revision of the conceptual framework regarding the role-playing game were part of the formulating, sharing and refining context.

**RQ 1 (iv) Did collaboration in networked classrooms create a supportive learning environment for writing by increasing awareness of audience through revision of writing based on feedback?**

The external editor in the form of peer feedback (in their subgroups) enabled them to ensure that the ideas presented would be clear and coherent. As such, clarifying, rephrasing, rewording and reorganising ideas and paragraphs were done. This conceptual planning and revision of ideas, words, phrases, sentences and paragraphs addressed the problem of lack of coherence and cohesion in the students' writing identified during the 1119/1322 English briefing (1995).

The students were willing to revise as they saw the need to revise. They wanted to express themselves as clearly as possible to communicate not only with their collaborative partners but also their international audience.

Hence, questioning and solving problems that occurred in the process of communication both within their subgroups and among their collaborative partners added value to their ideas. True to Harasim's (1989) observations, the students made the extra effort to form, defend and revise their ideas. This further encouraged livelier participation and higher levels of motivation. The primary motivator was as Silva et al. (1996) had noted, the real-life audience

who could respond to them, transcending cultural, language and geographical differences.

In other words, as communication became alive, the students were motivated to write and revise more. Language was no longer regarded as the product of communication but the medium that enabled meaningful and purposeful collaboration.

Furthermore, with the asynchronous nature of e-mail, stress was reduced, as the students did not have to reply immediately. They could reflect and think how to present their ideas more effectively. As Davidson and Tomic (1994) had pointed out, this social act of communication facilitated the crucial discovery of their own “voice”.

**RQ 1 (v) Did collaboration in networked classrooms create a supportive learning environment for writing by increasing opportunities for sharing and enriching ideas?**

Active and interactive collaboration in networked classrooms widened opportunities for sharing and enriching ideas. Having more people thinking and developing ideas together increased the pool of ideas. Hence, when they wrote, the students did not merely recall everything that they had learnt and regurgitated them.

On the contrary, they identified the requirements of the task (creating web pages that would interest a global community of Internet users) and attempted to produce an original idea that would interest the target audience. An example was the transformation of the product from an on-line magazine

to a role-playing game. Where class assignments normally tended to be predictable and monotonous with little variation from one students' writing to the other, the product of their collaborative effort showed better development of ideas and an increase in awareness of and greater concern for what the reader would be interested in.

Subsequently, they had a better sense of purpose and goal. They knew what they wanted to achieve and how they could achieve that goal. This helped them in defining the direction of their writing. Thus, it addressed the problem of irrelevant and repetitious ideas that lacked thought, originality and therefore, interest to the reader.

**RQ 1 (vi) Did collaboration in networked classrooms create a supportive learning environment for writing by allaying fears regarding technology?**

Collaboration in networked classrooms helped to allay fears regarding the use of new technology. Considering that the French and the Malaysian students had little experience in web page design, creation of web pages for the role-playing game was a difficult task.

However, they were not deterred. The Malaysian students collaborated with lecturers who had knowledge of web page design from a nearby university, Universiti Telekom. Assured of help and guidance when needed, they assured the French students that they would do the front-page design for their web pages. The Malaysian students further volunteered to be the webmasters (managers of the web site) if needed. The French teacher advisor took the cue

from the Malaysian students and sought help from her friend who had knowledge of information technology and web page design.

**RQ 1 (vii) Did collaboration in networked classrooms create a supportive learning environment for writing by facilitating delegation of tasks?**

Leadership qualities in collaborative work proved essential. The French teacher advisor managed to think of an integrated version that could incorporate all the suggestions proposed by the three schools. This was not an easy task. Later, she suggested what each school should do, such as having each school write an episode based on a round-robin fashion. She delegated tasks in a constructive manner -- as merely suggestions that were still open to discussions and comments -- not a directive. This openness put her suggestions in a positive light.

The success of their collaboration was mainly due to the commitment and leadership qualities of the team leader, the French teacher advisor. She showed exemplary leadership qualities that helped all three schools to resolve their main conflict i.e. whose ideas should be accepted and how the different sets of ideas could be integrated. The fact that she successfully managed to deal with these problems facilitated further progress as all three schools were satisfied that all suggestions were incorporated and the proposed integrated version was logical and practical. Hence, the choice of team and group leaders must be carefully thought of. It is definitely one of the key instruments of motivation and success.

In conclusion, any task need not be a burden to oneself. With collaboration, the burden could be shared. As stress was reduced, learning became more enjoyable. The students further perceived the task as within their ability to cope. In other words, they did not perceive the task as difficult. This complemented and encouraged their attempt at using technology to express and represent their ideas. Positive perception of the task and interest in performing well supported Story's criteria for motivation. Having won fourth place in an international contest, they were elated. The proud sense of achievement boosted their self-esteem and put future collaborative Internet activities into a more positive light. For the students, interest and performance were enhanced by achievement.

**RQ 1 (viii) Did collaboration in networked classrooms create a supportive learning environment for writing by increasing self-directed learning by stimulating interest to learn more by carrying out their own research?**

The students were so bent on presenting an impressive and interesting web page on the Internet that they carried out their own research on the mangrove swamp and made trips to polluted rivers that had been rehabilitated. They made the extra effort to learn more about water pollution so that they could share what they had learnt with their collaborative partners as well as with others on the Internet through their web pages.

Having peers to work with not only provided them with feedback but also reduced their dependence on the teacher as the sole source of knowledge and guidance. Hence, collaborative work provided an alternative source of

guidance should the teacher have less time for remedial or enrichment activities. This could prove to be helpful to weaker students.

Therefore, sharing and enriching each other's opinions transformed the writing task to a "window" that led to real-life communication and "enticed" the students to probe deeper to formulate and develop ideas, which would appeal to the audience. This agrees with Fulton's (1996) proposition that a supportive learning environment will encourage meaningful and purposeful communication as well as wider exploration of ideas.

The finding also supports Zamel's (1988) claim that a widened horizon for intelligent inquiry will facilitate the process of creating meaningful and better-developed content. Constructive and positive feedback further enhanced their understanding of how language created meaning

In addition, the opportunity for rich and numerous purposeful experiences motivated and challenged them to make the initiative to be responsible for their own learning. They were no longer passively waiting to be fed with information. On the contrary, they formulated the nature of the product, its contents and the best means of presenting it.

### **Implications to teaching and learning**

#### **Reconceptualisation of the teaching and learning process of writing and the methodology involved**

Teachers need to reorient themselves to emphasise more on the process of writing and not its product. It is not adequate to identify key words to the

question and discuss the possible content relevant to the topic. The writing task should also not be a matter of fulfilling the required number of words within the time frame given. On the contrary, teachers must focus on the formation of a conceptual framework that will guide the students towards writing a cohesive and coherent essay.

Marohaini and Zulkifli (1998) propose that the students can be trained in forming conceptual frameworks by exposing them to strategies to elicit contents that can be elaborated on, strategies to determine the direction of their writing and the different kinds of audiences, strategies to brainstorm heuristically, strategies to revise and to form cohesive sentences and a coherent flow of ideas. The lack of training in these strategies will underscore any rhetorical attempts to communicate effectively.

This implies that it is insufficient to merely provide content input as the students lack procedural knowledge to use that input to express their opinions. Teachers must therefore be cognisant of the cognitive aspects involved in writing i.e. the strategies involved in eliciting and exploiting content. The compelling importance of training students to know how to write and not merely what to write is essential to realise any learning objective.

As seen in this study, CMC facilitated communication. The students found it easier to brainstorm, clarify, and revise ideas with a greater number of audiences sharing the same goal. This reduced anxiety as cognitive load was shared while their identity could be concealed if they so chose to. In addition, there was a greater awareness of the writer-reader relationship.

Hence, CMC increased active and fruitful discussions through increased opportunities to share and enrich each other's ideas. The students also gained a

sense of empowerment as they could determine how they could look for the information they wanted, the sources they needed and work from there to achieve their objectives.

Moreover, the students in this study were motivated partly because the task of creating web pages was meaningful to them. They had the opportunity to publish their work on the Internet for the world to see. This increased their sense of achievement as they could share with others their masterpieces - something they could call their own and had its own value. Hence, writing assignments must be meaningful to the students in order to motivate them to inquire and think in greater depth and from a broader scope to obtain their objectives. The topic for assignments should not be taken wholesale from reference books or model question papers that target at the examination.

In order to further enhance meaningful discussions, the process of discussion could also be made visible to the teacher through threaded discussions in mailing lists, which archive all mail to the list. In this manner, the teacher will be able to monitor whether discussions are in the proper direction and adequate in depth and scope. He or she will have convenient access to provide appropriate feedback where necessary.

As such, computer-mediated communication has the potential to facilitate the inculcation of critical thinking skills by encouraging active and interactive communication, promoting the spinning of a web of associated ideas and constructive problem solving in the process of resolving differences in ideas. Hence, CMC should be regarded as an invaluable tool for facilitating interaction with the writing environment in terms of the context and the audience involved.

As pointed out by Flower and Hayes (1980) and Hughey et al. (1983), interaction with the environment and actual audiences are pertinent factors in the cognitive and creative process model of writing. Both point out that the writer is involved in an iterative process of writing. The writer has to identify what information he needs, how to search for the required information, how to evaluate this information to existing schema and finally, and how to form meaningful concepts that can provide a holistic view of prior and current information. Hence, since the tool for facilitating and enhancing learning is already at our doorsteps, it is timely to reconceptualise methodological applications to support and enhance pedagogical practices. Guiding the students to use relevant strategies is an untapped resource that can facilitate meaningful learning. Thus, the urgency of reconceptualising the methodology of teaching and learning writing is significant.

### **Change the mode of assessment**

As Malaysian students have been conditioned to write mainly for assessment purposes, the teacher can begin transforming their mentality of writing merely for assessment to writing for communication by changing the mode of assessment.

A certain percentage of the grade for assessment should be allocated to the initial product and subsequent drafts besides the final product. This will provide a means to assess how much or whether they improve from one draft to the other.

Furthermore, if the teacher sets certain aspects that she or he will look into in the drafts to be handed in, then the students can work on these aspects. Thus, it will be easier for them to see which aspect they will have to pay more focus on such as development of ideas, organisation or grammar. The students will also benefit if they see their grades improve with subsequent drafts. Marking of essays will also be less tedious as only these aspects will be looked into for each draft sent in. Hence, this continuous assessment mode takes the process of writing into consideration and highlights the learning objective at each stage in the process.

### **Provide opportunities for actual experimentation in teaching practice**

Other than theoretical presentations, teacher trainees should also be given an opportunity to apply these principles of technology incorporation by adapting the examples that they had learnt into their teaching practice. Supervision and proper advice should be given during this period. Only then can we say that our future teachers are equipped to handle the classrooms of tomorrow -- having experienced first hand the possible benefits and limitations of technology incorporation. Philosophies will always remain as abstract principles unless they are translated into actual experience. Only then will teachers be convinced of its value.

### **Provide actual examples**

It is important to note that it is not sufficient to merely train teachers with the technical aspects of how to use a particular technology such as how to create a web page. What is more important is how to use this technology pedagogically and efficiently. Thus, any teacher-training programme in the future should provide for a component that shows them actual examples of the use of technology in the classroom.

### **Encourage collaboration with other teachers, experts or industries interested in the application of technology in education**

Malaysian teachers can also form collaborative relationships with teachers from other schools or anywhere in the world. They can share their experiences, problems and the corresponding solutions. In addition, they can seek advice from and collaborate with experts or industries interested in the application of technology in education.

Similar to the students' sense of community and assurance that someone out there will and can help them, the teachers can learn from each other and help each other out. Although the teaching and educational context may be different, the benefits in terms of self-enrichment and self-development should not be looked upon lightly. Teachers will then have their own avenues for wider discussions and exposure to matters outside their immediate circle that could benefit them personally as well as professionally.

## **RESEARCH QUESTION 2: OBSTACLES TO COLLABORATION IN NETWORKED CLASSROOMS**

### **RQ 2 a (i) Did collaboration in networked classrooms face collaborative constraints in terms of inconsistent contributions?**

Commitment from all partners concerned is crucial to any project's success. In this study, the French and Malaysian students were actively collaborating. However, the American students did not contribute until almost before the date line. Hence, this complicated the process of deciding on the final story line. By then, it was too late to develop the stories as planned -- in a round-robin fashion with each school writing an episode. Due to the lack of time and fears of difficulties in accessing the server, each school finally created their own web pages and their own stories.

The choice of collaborative partners could not be looked upon lightly. Assuming that the success or failure of any learning experience will influence the students' attitude towards future assignments involving the use of technology, it is imperative to ensure that all hindrances to positive and meaningful learning be dealt with as much as possible prior to actual learning.

### **RQ 2 a (ii) Did collaboration in networked classrooms face collaborative constraints in terms of age gaps?**

The American students were in their junior high. They were much younger than the Malaysian students were. This could have resulted in

differences in opinion as to what content would attract an international audience. The American students proposed suspense thrillers, which the Malaysian students considered childish and lacking in depth and complexity.

However, the Malaysian students did not know how to inform the American students that they were not going to accept these proposals. Hence, they turned to the team leader, the French teacher advisor who fortunately, managed to figure out a way to incorporate almost everyone's ideas in a logical manner.

The American students' contributions were actually unique and interesting but the difference in the level of maturity and subsequently, the difference in interest could have resulted in the awkward situation mentioned earlier where no one dared to say no.

**RQ 2 a (iii) Did collaboration in networked classrooms face collaborative constraints in terms of holiday constraints?**

The students did not encounter problems communicating with each other using the e-mail despite the difference in time zones. However, during the school holidays, only those with e-mail accounts at home could communicate with their counterparts in France and America. Hence, not much work was done. Therefore, teachers must plan well ahead what they wanted to do in order to work around school holidays where the problem of insufficient facilities could hamper collaborative efforts.

**RQ 2 a (iv) Did collaboration in networked classrooms face collaborative constraints in terms of time constraints?**

The students could only use the computer after school hours and often had to labour late into the night. Although the contest itself was well spaced out over four months, the students were told to concentrate more on their studies, as the result of the contest was inconsequential. The view that such contests were not significant to the students' experiences and learning drew a tight knot over their time. Some of them even felt discouraged and were tempted to drop out. However, group unity was emphasised by the group leader and the eventual outcome of winning fourth in this international contest was well worth all the effort.

**RQ 2 b (i) Did collaboration in networked classrooms face co-operative constraints in terms of internal conflicts?**

The students had initially acknowledged that successful collaboration had to involve people who were willing to accept others' opinions, able to reason logically with others and willing to work as a team. In the excitement of producing interesting ideas for the web pages, many students enthusiastically proposed various suggestions.

However, since the role-playing game was the brainchild of one of the student leaders, she felt that she knew what would best suit the game. As such, many suggestions were shot down. The atmosphere was also

undoubtedly tense. Many students were angry and disappointed at the manner in which the discussion was dealt with.

Finally, another student leader's suggestion to break into small groups to discuss before presenting their ideas to the whole group proved fruitful. Since the diversity of ideas were minimised after being filtered by each subgroup, it was easier to reach a consensus.

As Fatima (1995) has suggested, team building and negotiation skills should be taught before embarking on collaborative work. It should not be assumed that since they have done collaborative work before for class assignments, they would have little problems collaborating. The teacher should also enforce firmer facilitation skills.

**RQ 2 c (i) Did collaboration in networked classrooms face technological constraints in terms of server malfunctions?**

The Internet Relay Chat (IRC) software provided by the contest secretariat was too technical for basic users of e-mail like the Malaysian and French students. Instead, the more popular mIRC (another IRC) software was used as it was text-based. The students merely had to type in text and chat with the other person. They did not need to manoeuvre graphics called avatars nor read the too-technical help guide.

The most important obstacle was that of the instability of the contest server. There were times when the server broke down (crashed), requiring all messages among the three schools to be resent to the server for record purposes. Similarly, the contest secretariat had to resend all messages to the

participating schools. Once, the Malaysian students even experienced losing all their files stored in the server due to the crash. Fortunately, these were just the files that were meant to provide an example to the French and American students how the role-playing game was supposed to work.

There were also times when the server could not be accessed at all. This was especially untimely as many schools were busy sending their web pages to the server as the deadline was near. The reason for this inaccessibility was that of another crash in the server.

Unfortunately, the Malaysian students lost all their files. Furthermore, due to the school holidays, they were only informed of the crash and the loss after they came back to school. Fortunately, the contest secretariat allowed an extension of four days to resend these files again. The students panicked but were able to meet the deadline. Hence, all work should be done in advance and be ready before the deadline. Allowance should be given to imperfections in technology that could mar the success of any project. Precaution to backup files should always be taken.

Lack of facilities further hampered efforts to enable more students to use the e-mail at their convenience. Even for web page design, the students had to take turns using the computer.

Collaborative work can best be carried out if each student has access to a computer and can freely use this computer as and when he or she wants to. Otherwise, the lack of facilities will deprive some students who are more shy and passive in the competition to get a computer. Maintenance of computer laboratories should also be taken into account.

## **Implications to teaching**

### **Care in choosing collaborative partners**

Teachers who are experimenting with technology incorporation must be careful in choosing collaborative partners, whether local or foreign. All parties involved must commit themselves to achieving a common goal. Without commitment, plans for learning will go awry and result in unpleasant learning experiences. This in turn will discourage future learning associated with the use of technology.

On the same note, teachers should be careful in choosing collaborative projects, especially those that involve partners from all over the world. These projects should be well established and well tried out by others. Having well-defined objectives and schedules, a panel of experts to refer to for advice, moderation or troubleshooting will lessen the administrative concerns of collaborative work. This will allow the students and teacher advisors to deal with the more pertinent matter of learning and facilitating the learning process respectively. Examples of well-established projects are the AT & T virtual classroom contest, Thinkquest and Cybersurfari.

### **Negotiation and team-building training**

Having decided on the project, the next concern should be training the students in negotiation and team-building skills. They must practice tolerance and be open to accept and consider others' ideas. Furthermore, belief that

collaboration will enhance the quality and development of ideas that will benefit all parties must be the primary understanding that bonds the group members together. There should not be any domineering group or person that discourages or stifles another student's contribution. Hence, the importance of team-building skills cannot be understated.

The lack of computer facilities is another concern that can hinder successful learning. If there are insufficient computers or the computer laboratory is not well maintained or not easily accessible to the students, then they will be discouraged from experimenting with the new technology. This will hamper their learning process. It will be ironic that the tool meant to widen their perspectives and resource of information has been disabled and has become a white elephant for display.

This implies that there must be sufficient funds not only from the Ministry of Education but also from industries interested in applications of technology in education. Hence, sufficient funds and a supportive administration that views technology as a potential catalyst to enhance the teaching and learning process must complement the strong belief in technology integration in education.

The motivational aspects identified by the students in the questionnaire confirmed the above descriptive findings. Various factors highlighted previously as motivating factors were grouped together into general categories based on Warschauer's (1996) factor analysis. These factors were categorised as communicative, learning and achievement aspects.

### **RESEARCH QUESTION 3: MOTIVATIONAL ASPECTS OF COLLABORATION IN NETWORKED CLASSROOMS.**

**RQ 3: Did collaboration in networked classrooms motivate students to write and communicate better?**

#### **Communicative aspects**

The most significant motivating factor indicated by the students while collaborating in networked classrooms pertained to communicative aspects. This was supported by the significant contrast in pre and post-test analysis that indicated belief that writing to others by e-mail could help them to develop their thoughts and ideas, enable them to learn more about different cultures and people and provide more opportunities to practise and improve their English.

Similar to Frizler's (1995) findings, the students indicated in their learning journals that they were excited with the mere prospect of being on-line. To them, it was a novel means of communicating with a real-life audience. The findings imply that interactivity was the primary element in motivating students to write on-line. The added plus point was that their audience were from an international community with different cultures, experiences and exposure. Thus, they were eager and curious to exchange opinions.

In addition, being free to explore and write anything that they deemed suitable and relevant released them from the constraint of working within a set

framework of what they must write. Hence, the students explored and discussed extensively before any final decision was made. In addition, since they were the pioneer group to communicate and participate in an international virtual contest, they were determined to impress others. They made full use of the e-mail to share and enrich their pool of ideas as well as delegate tasks and resolve problems.

The equal opportunity to express one's ideas supported Hanson-Smith's (1997) proposition that networking can provide writing teachers with a means to transform the pedagogy of composition as a product to a process. Since no one dominated the discussion, the students were free to express themselves at their own time and their own pace.

### **Learning aspects**

As the students begin to explore further on their own, guided by the teacher's advice, they will learn more. Findings from the motivational aspects questionnaire indicated that communicating by e-mail helped them to be more independent and creative in their learning. Since they could learn from each other, they found revising on the computer easier and more meaningful. There was also a significant increase in pre-post test results, which indicated that the students felt they had more control over their own learning.

### **Achievement aspects**

Questionnaire findings further indicated that the students were highly motivated by achievement aspects as they realised the importance of mastering computer skills for the future of their careers. They were also excited at seeing the writing printed or published. Hence, they were eager to take up the challenge of using computers. Consequently, it is no wonder that the students wished to continue using the computer in their English class as learning to use the computer gave them a sense of accomplishment.

### **Implications to teaching**

Since interactivity was the key element in motivating students to write future on-line writing courses should take into consideration tools that could provide for and enrich the interaction process. E-mailing and chatting features should still be retained as these provide asynchronous and synchronous communication. If the student needs time to reflect, he can choose to use the e-mailing feature. However, if he is comfortable with the topic and is confident to chat on-line spontaneously, he can choose to chat. An open forum with immediate response from participating members can serve to stimulate more development of ideas.

It cannot be denied that exposing students to authentic English (which may or may not be perfect English) can have some negative effects on the students if we presume that students tend to model after the language that they are exposed to. However, the benefits of collaboration in networked

classrooms as stated above can address the problem of failure in identifying what is required of the task, inability to develop interesting and thoughtful ideas, inability to write coherently and cohesively and most important of all, to stimulate the desire to write. As such, the benefits far outweigh the problems that may arise.

In order to deal with this exposure to possibly substandard English, the teacher can in fact, use some examples of these for remedial work. He or she can access all correspondence among students from the server and monitor the conversations. It will also be possible to pick up sentence patterns that will need remedial work.

Hence, the more students explore by themselves, the more they will learn. This is indicated in the finding in the questionnaire that they can learn English more independently when they use a computer. The teacher should therefore prepare himself or herself to accept less control of the learning situation.

The focus of the class will no longer be the teacher, but the students. This change in the focus of power and control may be unnerving to some teachers. However, if they are convinced of the value of incorporating technology and the benefits it can bring to their educational objectives, then they will be in a better position to handle the change in paradigm from a teacher-centred to a student-centred classroom.

Furthermore, the use of technology in the classroom should not be disregarded or treated as just another hype in the educational scene. It is undeniable that information technology will encompass each and every aspect of our lives in the future especially in terms of career advancements. Thus,

teachers need to rethink the way students are being equipped to handle the job market in an information-enriched environment.

The students should be equipped not only with knowledge but the ability to identify the requirements of the task, how they can best fulfil these requirements as well as how they are going to work with others as a team. The challenging world of information technology will engulf them in a world of information that necessitates quick and wise decisions.

Hence, writing assignments should cover a broad scope of that encourages the students to explore deeper matters raised in their syllabus. There is not much point in providing students with the points and requiring them to develop their ideas based on these points. Their thinking skills are not sharpened. Their mentality is still limited to the contents of the textbook and what immediately surrounds them. They are not exposed to what is outside their immediate circle of friends and teachers.

Undeniably, training the students to think deeper will involve a longer period of time as they are currently used to getting facts and information that they need from reference books. They need only to memorise these facts. The main reason for this is because the examination requires these facts. It is also the examination result that will determine their fate in whether they can enter the university.

As such, unless the kinds of questions raised in the examination and the mode of assessment focus more on the students' thinking skills and ability to apply these skills in situational contexts, then the use of technology will indeed be merely just a hype. Technology will then be a novel means of learning. After a while, the students will get used to it. Teachers will still be

rushing to finish the syllabus. Technology may just be another paraphernalia again. Surely, this can be avoided if the Ministry of Education revises its mode of assessment and organisations chip in to provide the necessary funds and expertise to make it work.

## CONCLUSION

Soo and Ngeow (1997) observe that technology enables increased exposure to matters outside the curriculum by allowing the students to surf the World Wide Web, use the e-mail and chat with others. As such, their expectations of what they can learn will increase. However, technological innovations should not be allowed to overtake pedagogical practices as learning can become uninteresting, meaningless and even without direction or goal.

In view of the incorporation of technology into every aspect of our lives in this information and technological age, educationists must flow with the dynamic changes in society and the world or lose the impact that education is meant to have on the younger generation. With technological integration, learning is no longer constrained by geographical locations nor restrained by the pace of learning set by the teacher. If its potential is exploited, learning activities can encourage motivation to learn, stimulate higher-level thinking, and provide experience in relating to real-world possibilities and situations through interactive and collaborative communication.

It is undeniable that technology in the classroom can contribute to a surge in curiosity, creativity and teamwork. The students are more exposed to

a richer environment of information and interaction, thus breaking down the walls of the classroom. Furthermore, with the prospect of collaboration, they need no longer be confined only to the world immediately surrounding us. In contrast, they can reach out to the world out there. Thus, the vast prospect of mutual benefit that awaits them should steer teachers and the administration to plan and assess how the Internet 's potential to complement the teaching and learning process can be exploited.

We should also bear in mind that technology integration has to be considered in totality as a system. This system includes society's needs, educational policies and the administration as determiners of change. Therefore, sufficient funds, adequate expertise, a supportive administration and most importantly, a mode of assessment that emphasises on the process of learning are prerequisites to any successful integration of technology in education.

In other words, if technology incorporation is to be successful, education must first be restructured. Continuous assessment must be carried out from one stage of the process to the other. Teachers must be convinced of the value of technology integration and be provided with sufficient training to manage technological resources and facilitate student-directed learning. Most importantly, teacher trainees must be given ample opportunities to experience applying the use of technology to meet educational objectives before venturing into the actual teaching world. As Arun-Tripathi (1988) points out, "technology integration is not (merely) about technology. It is about restructuring education first and using technology as the tool. Hence experience in using it is imperative."

Lee and Reigeluth (1994) conclude that the “fragmented” regard for education as merely teaching and learning disables it from coping with the “complexity, mutual causality, purpose, intention, uncertainty, ambiguity and ever accelerating dynamic changes that characterise our systems and the larger societal environment.”

Hence, any consideration for technology integration must be carefully planned to meet the needs of our educational system and society. We must learn from hindsight our mistakes in the past, strive forward with insight to today’s potential and foresight to rise above the challenges of tomorrow. We must also proceed with caution for there is no perfect system and the myriad influences upon the success of our educational system and upon our students cannot be ignored.

There is also no conclusive research that proves that integration of technology in the classroom will definitely turn out well. The onus is still on the discretion of the teacher to determine when and how to integrate technology in the classroom. It is the teacher who directs technology, not the other way around.

The learning equation is constantly subject to change. However, the dream to achieve must always inspire and widen our imagination to reach out and hope for the best. Hence, let us venture bravely towards the global frontiers of tomorrow. It is now up to us to innovate and empower ourselves by spinning the web of collaboration.

## **FUTURE AREAS FOR RESEARCH**

As mentioned earlier, the success of collaborative efforts is partly dependent on the success of the subgroups. Problems arose among subgroups due to lack of negotiation and team-building skills. Hence, future research should consider means of training students in the above-mentioned skills and whether this training will contribute positively to the team. If such training does have constructive influence on group dynamics, then the context and conditions that facilitate actual applications of these skills must be taken note of and emulated in future discussions.

In addition, purposeful interaction and communication were cited as key factors in determining the success of collaboration in networked classrooms. Hence, if collaboration is to be a key element in any on-line course in schools, the task assigned to them must be wide in scope so as to necessitate collaboration as well as meaningful and relevant to their needs and context.

Therefore, future research can focus on the development of an on-line writing course. Focus will be on the development of its curriculum, assignments, modes of communication and collaboration as well the effectiveness of on-line learning for academic purposes.