CHAPTER TWO - LITERATURE REVIEW

THEORETICAL MODELS OF COMPOSING

According to Hughey, Wormuth, Hartfield and Jacobs (1983), the writing process is a creative and active process that taps into the writer's knowledge, experience, intuition, emotion and expectation of what the readers know and would like to read. Once a reason or purpose for writing is identified, the writer initiates a search into his knowledge and experiences to discover what information he has and decides what he wants to communicate.

If there are gaps in information, he will have to identify what information he needs. In order to fill these gaps, a search for other necessary information in order to generate related information is performed. Subsequently, he will attempt to elicit and associate the new-found information with his existing information. This continuous search and relation of new and existing ideas will then result in the formation of new perceptions and deeper understanding of the topic (refer to Figure1).
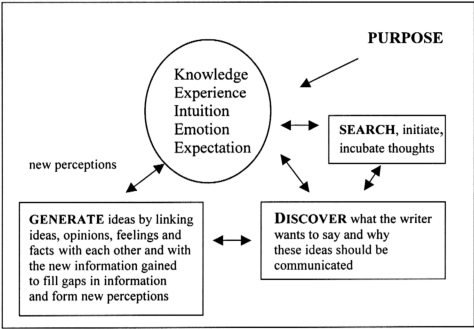
Figure 1. Discovering and generating ideas in the creative process model for writing

(Hughey et al., 1983:11)

The process of discovering and generating ideas are iterative. There is a constant discovery of what the writer wants to focus on, which information is relevant and how he should present his ideas. There is also the addition, deletion, reordering and modification of words, phrases, sentences and paragraphs (refer to Figure 2). This shaping or re-vision of ideas in order to fit the purpose and audience in mind is therefore an essential process, which should not be bypassed. Considering its importance, re-vision plays a significant role in determining the clarity and effectiveness of the message -- the product of the writing process-- to the audience.

Knowledge
Experience
Intuition
Emotion
Expectation

PURPOSE

SEARCH, initiate,
incubate thoughts

new perceptions

GENERATE ideas by linking
ideas, opinions, feelings and
facts with each other and with
the new information gained
to fill gaps in information
and form new perceptions

DISCOVER what the writer
wants to say and why
these ideas should be
communicated

SHAPE or **REVISE** opinions, feelings,
experiences, knowledge to present what is
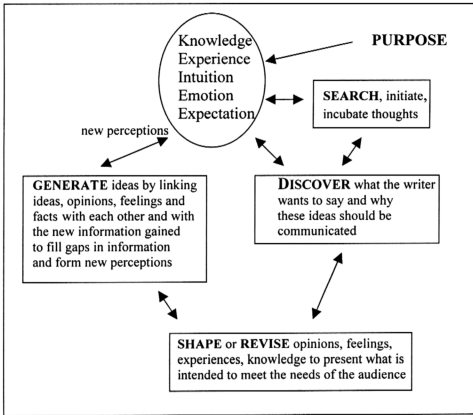intended to meet the needs of the audience

Figure 2. The role of re-vision in the creative process model for writing

(Hughey et al., 1983:11)

In short, the creative process model for writing according to Hughey

et al. involves the creation of a product that is dependent on the process. At

each stage of the discovery, generation and shaping process, new perceptions

and new understandings are formed. These will result in new products. These

new products however, are only temporary and should not be considered as

complete (refer to Figure 3). The revision process will only stop when

sufficient clarity in presentation is achieved. This determination of clarity is

best attained when the writer has readers who can respond to his writing. As

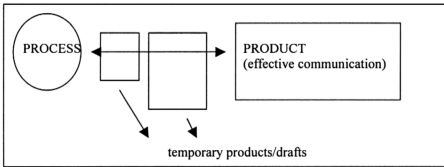such, collaborative learning can serve to enhance the writing process.

Figure 3. The relationship between process and product in the creative process model of writing.

(Hughey et al., 1983:11)

Hughey et al.'s creative process model of writing is well supported by other models of writing. An example of this is Kucher's (1985) text world production model of writing (refer to Figure 4).

The writer has to first establish the context of the situation (what the task requires). Then, a search is initiated in order to locate and retrieve the necessary information. In this matter, three processes will be involved.

The first process is schema location and activation. The writer identifies what information he already has and needs. Goals and strategies will then be planned to obtain relevant new information to fill in the gap between what the writer already knows and what he needs to present his information clearly and in an original and interesting manner. Some of these strategies are macro-generating strategies (generating main ideas), micro-generating strategies (generating details of main ideas), macro-integrating strategies (forming a conceptual framework), and micro-integrating strategies (forming a coherent framework). This process is similar to Hughey et al.'s discovery and generation process.

Schema evaluation and schema instantiation (synthesising the new relevant information with the existing information) automatically follow that of schema location and activation. They involve identifying whether the new information that is obtained is relevant to the writer and the audience's needs through selection strategies (matching ideas to the audience). Similar to Hughey et al.'s shaping or revision process, the schema evaluation and instantiation processes integrate new perceptions to existing knowledge according to the readers' expectations.

Modification of words, phrases, sentences and paragraphs are monitored by the language register. Identifying the readers' knowledge and language level help the writer to adjust to their level. This means that if the readers are professionals and are well read, then the language and approach used have to be formal and academic in tone.
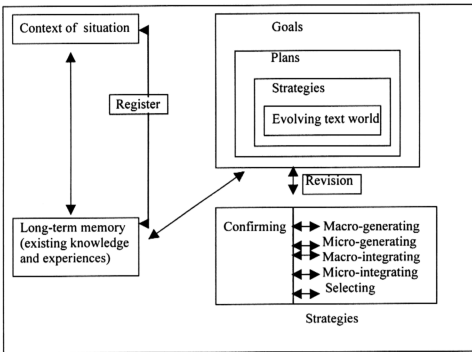
Figure 4. Kucher's text world production model of writing

(Kucher, 1985:230)

Another similar model is proposed by Flower and Hayes' (1980) cognitive model of the writing process (refer to Figure 5). It consists of the following components: task environment, the writer's long-term memory, writing processes and the monitor.

The writer's long-term memory serves as a data bank of knowledge and experience that helps him to set goals, generate and organise ideas. These ideas are then translated into written form with due consideration for the audience's expectations. Therefore, if the written form is found to be unsatisfactory, then revision has to be carried out. The monitor further ensures that the plans formulated earlier on are in line with the purpose of writing and that the product will suit the task environment (the requirements of the writing task) set before him.
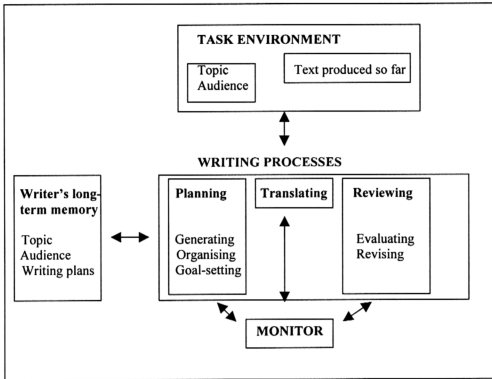
Figure 5. Flower and Hayes' cognitive composing process

(Flower & Hayes, 1980:112)

These theoretical models of composing indicate that writing is a dynamic process. It is also evident that planning and revising should occur throughout the writing process to encourage exploration, discovery, generation and revision of new perceptions to achieve effective communication.

However, many Malaysian students are unable to analyse the requirements of the task set before them. Subsequently, they are not able to proceed by themselves according to the processes discussed above. On the other hand, they have to be told what to write by the teacher. In weaker classes, the teacher even has to provide the points to be elaborated on. Hence, it is evident that many students are not able to engage in thoughtful learning that should result in good writing.

PROBLEMS WITH THE TRADITIONAL METHOD OF TEACHING WRITING

Writing is regarded as a product. The process that results in this product is seldom looked into to identify where the students have erred and where they need further attention to refine their development and organisation of ideas.

After the teacher has given them the topic to write on, students will usually try to recall whatever they have been taught and elaborate based on these. Little effort is spent on identifying other ideas that may be relevant and may enhance the quality of their writing. This results in predictable and monotonous essays.

The lack of revision in terms of choice of words, phrases, sentences and paragraphs further results in repetitious and irrelevant ideas and a lack of direction in writing. Similarly, since they seldom review the flow or relevancy of ideas, the ideas presented are sometimes confusing.

Several factors have been identified as reasons for these problems. They are lack of receptiveness to research findings, view of teachers towards themselves as language teachers, disregard for the value of revision, and lack of motivation to write due to an unsupportive environment.

The rationale behind these problems

Lack of receptiveness to research findings

The underlying reason for the above scenario may be due to contextual factors that hinder the students' development as writers. In her review of recent research on writing pedagogy, Zamel (1988) notes that research in process writing has not transformed writing pedagogy. Many teachers still insist on the traditional model of exercises and drills, with rare opportunities for students to actually venture out and write on their own.

A possible reason is that the process approach requires teachers to assume a less authoritative role and to give up their perspective of themselves as the sole provider and owner of knowledge. Moreover, they have to accept the fact that allowing students to explore can result in goals that cannot be easily predicted upon. Therefore, establishing a supportive environment should be taken into consideration to encourage students to write, as they should.

View of teachers towards themselves as language teachers

Furthermore, many teachers still view the students' text as final products that should be evaluated based on their preconceived notions of good writing. These preconceived notions however, reflect on their view of themselves as first and foremost, language teachers. Since they perceive language as grammar and sentence construction, they tend to read and evaluate text based

on these aspects. Many teachers do not consider the text as a whole. They are too focused on language-related problems. An examination of ESL writing textbooks further confirms that grammar and the product of writing are overemphasised. As such, teachers sometimes forget that the actual problem is with meaning formation and thus is conceptual in nature (Zamel, 1988).

She further quotes an ESL student's comment that shows the effect of neglecting thinking and problem solving skills:

> My teacher emphasises on the rules and limitations on how to write ..., for example, avoiding a topic too broad, too subjective, too controversial, too familiar, too technical. She is my reader, my grader. Since she emphasises on rules and limitations, she must grade according to these things. So, I have to follow such rules. Then in such circumstances, I feel I did not dare to strike even a step; all around me were abysses - each step was full of danger. I felt I was restricted and I have no confidence to write (p.698).

Since the teacher's red ink often strikes their grammar and vocabulary, many students begin to assume that evaluation is based solely on these aspects of the language. It is no wonder then that unskilled writers often make corrections on the surface or word level, in what Sommers in Porte (1996) terms a "thesaurus philosophy."

Robinson -Staveley and Cooper (1990) further find that students who view writing as merely producing an essay with correct grammar often have difficulty in writing because they are trying to generate, develop and organise their ideas, form complex sentences and edit their sentences at the same time. Thus, many students often suffer from writer's block as they attempt to produce the perfect idea and perfect sentence during their initial attempt.

Writing is therefore reduced to merely a matter of getting the correct grammar and vocabulary. This negates the value of content development, organisation and the presentation of clear ideas. Thus, a reductionist and mechanistic approach to writing certainly denies the very nature of writing as a complex, recursive and non-linear process of exploration and discovering meaning.

Disregard for the value of revision

This perception of writing as producing a product often causes revision of ideas to be deemed unnecessary. However, according to Nold in Humes (1983), revising involves

> changing the meaning of the text in response to a realisation that the original intended meaning is somehow faulty or false or weak; adding or substituting meaning to clarify the originally intended meaning or to follow more closely the intended form or genre of the text; making grammatical sentences more readable by deleting, reordering and restating; and correcting errors of diction, transcription and syntax that nearly obscure intended meaning or that are otherwise unacceptable (p.210).

Hence, revision encompasses editing words, phrases, sentences and paragraphs as well as reconceptualising and reorganising ideas.

Porte (1996) agrees with Nold's notion of revision and adds that editing grammar and spelling alone should never be termed as revision. He refutes the idea that revision deals with comprehensible structure, organisation, and clarity of ideas. Thus, correcting essays based on grammar, vocabulary and

punctuation alone without due consideration for its communicative clarity will not be able to create and communicate meaning effectively.

He stresses that revision actually means re-vision. In other words, writing is not just a one-time product to be manufactured according to the topic given but involves seeing again the ideas which were first generated, putting them into an orderly manner and identifying ways to best present these ideas to a target audience. Thus, there must be "freedom to experiment with ideas and style, with language itself, (which) creates both real interest and real learning" (Lewitt, 1990:3).

However, since the value for revising is not apparent, the students will most likely and conveniently leave it out. As such, they will have little opportunity to revise or clarify what they want to say. In fact, since the extent of their idea exploration and discovery are short-lived, the students may not even know what they actually want to say. In addition, as the initial drafts are merely premature editing attempts, what they may have is actually just a rough idea of what they should have explored further. Moreover, the topic given may be irrelevant to their real life. Hence, revising seems to be a mere waste of time.

Furthermore, the reader is no longer a significant person that they have to consider while writing. This is because nobody else is going to read their piece of work except the teacher. The only person they are concerned with is the teacher and what he or she wants. This further reduces their motivation to revise as the teacher has little time for feedback. Moreover, revision often means exposing them to further censure and scrutiny. As many writers of

English will confess, this is a factor that many will try to avoid unless they are convinced of its value and in the positive intentions of the person concerned.

Subsequently, the students often stop developing and refining their ideas once they think the form or the number of words required by the teacher is there. Furthermore, many students perceive that learning means regurgitating what the teacher taught.

Therefore, students' essays are sometimes mere recall or elaboration on anything that they had learned about the topic regardless of whether they are relevant or not. What they think and how they arrive at it is of less importance. Moreover, there is little need to propose their own ideas, or defend their suggestions. The assumption is that so long as they write whatever they have been taught the teacher cannot fault them but will have to award some marks.

As a result, the communicative idea or content is neglected. Although they should have continuously attempted to explore or discover new ideas and perceptions, most of them stop at the first draft. They stop too soon. As such, the students' essays show their inability to develop interesting and thoughtful ideas, thus resulting in predictable and monotonous essays that are similar to anyone else's in the class.

In addition, since they seldom revise, the ideas presented lack direction and coherence or cohesion. Thus, the writing assignment does not achieve its purpose in providing students with the opportunity to learn and explore more about a topic.

Lack of motivation to write due to an unsupportive environment

In addition, since the product produced is actually an initial draft, the quality of the product reflects only premature editing attempts. The students tend to be too bound by language concerns and seldom review the text. As such, they are unable to detect whether there is a mismatch between their writing intention and the final product.

Since most students stop merely at that initial draft, they do not perform well. Consequently, they get demotivated and frustrated. They will normally wonder where they went wrong and how to rectify the problem.

However, the question is how they are going to improve if they do not know why they do not meet the mark. Even if the teacher writes general comments regarding the students' writing, the comments are often too general to be helpful unless there are further discussions to better elaborate and explain the feedback given. On the contrary, what normally happens is that after a grade is given and the essay is returned for corrections, there is little time for remedial work or further discussion with the students. In fact, many teachers regard the exercise as complete. Thus, the students may be left wondering why their mistakes are considered needful of corrections and how they can remedy their weaknesses, but find no answer.

Need for a solution

The Malaysian Ministry of Education's Teacher Education Division (1996) is concerned that the students' passivity will discourage them from

taking charge of their own learning. They are told what to do, when to do it and how to do it. As such, many students have become conditioned to depend on the teacher as the primary source of information to provide personal attention. However, there are limitations to what the teacher can do with a large number of students. This leaves them with the only other source of guidance and help -- their peers.

However, classroom activities are structured in such a way that competition among students is prevalent. It is often so strong that the better students often keep whatever they have learned to themselves for fear that the other person will do better than him. On the other hand, the weaker ones are passive and dare not question the information posed to them. They lack the confidence to form their own opinions and often memorise by rote. Therefore, if the teacher discusses a certain point or asks a particular question, few might be eager to answer and many more might try to make themselves invisible. As such, providing a supportive environment through peer feedback is desirable.

A NEW PARADIGM TO TEACHING WRITING

Importance of interaction between the writing environment and the writing process which focuses on purposeful writing and meaningful content

Edelsky, in Zamel (1988) suggests that teachers are often unaware of the cognitive and affective consequences of interaction between the writing

environment and the writing process. She proposes that there is a need to provide a supportive environment in terms of the kind of writing task and provision for peer feedback in order to help students who cannot cope by themselves.

In her research on the development of writing in a bilingual program, Edelsky in Zamel (1988) claims that Spanish students who had no formal instruction in English were able to write in English. This was because the teacher concerned believed that writing is produced not only in a context, but also through it. Her students were successful in learning English because their literacy programme focused on purposeful writing for different kinds of audiences, frequency in writing and a choice of their own topics.

Confirming the importance of a supportive environment, S. Diaz, Moll and Mehan in Zamel (1988) note that if teachers regard writing as a meaningful, purposeful and communicative activity, then students will become engaged in collecting their own information, doing their own research and analysing these data. Responsibility is also transferred from the teacher to the student. Through this process, the students will begin to view writing as a means for "intelligent inquiry, for exploring the world around them."

Zamel (1988) further points out that in both cases, the students were encouraged to write longer texts and asked to write more frequently. The teacher also regarded the act of writing as communicating content that is significant to the writer and the reader. There was also proper emphasis on creating meaningful content. Hence, the instructional activities were "rich in opportunities for exposure to, production of and reflection on English discourse ... with guidance and feedback on topics of personal interest."

A successful language activity should therefore emphasise the very significant nature of writing as communication with a real purpose and audience in a supportive environment that provides opportunities for student collaboration and peer feedback. Only then will the students regard themselves as writers and be willing to take the risk to voice their thoughts in writing.

Zamel (1988) thus surmises that the cognitive, affective and situational factors in teaching and learning writing should always be given more thought.

The students can perform better if they are given frequent opportunities to write and participate as a community of writers. As they transform their view of themselves from students who are writing to please the teacher to writers with something to communicate, the writing task becomes more purposeful. Thus, interest in the task and correspondingly motivation to write increases. Furthermore, with help from the readers, the task becomes less difficult to manage. As such, students are motivated to write more as they perceive themselves as competent in handling the task.

The higher likelihood of positive feedback, increased interest in the task, better student performance and manageability of the task resulting from collaboration agree with Story's (1986) findings on factors that influence continuing motivation, i.e. whether students return to the same task at a later time.

Story (1986) identifies four factors that have shown positive correlations with motivation. These factors are teacher evaluation, student performance (and students' perception of their competence on the initial task), task difficulty and interest in the task.

He finds that negative feedback results in lower motivation. If the students constantly get negative feedback from the teacher due to their lack of planning, inadequate development of ideas and clarity in presentation that do not take the audience into account, then they will perceive themselves as not competent to handle the task.

Merely writing a single encouraging comment or telling them to write more so that they will improve do not provide sufficient reason for the extensive effort needed for students to develop and revise their essays. They will regard the task as too difficult for them to handle. In addition, since their performance is below par and they are open to censure, they lose interest in the task. In other words, they become demotivated.

He further finds that girls are more motivated by a sense of achievement or competence. However, the boys are usually motivated by a sense of challenge or mastery. As such, Harter in Story (1986) theorises that boys tend to have an intrinsic sense of mastery motivation whereas the girls are more inclined towards extrinsic motivation in the form of approval. Therefore, the teacher has to provide the right kind of stimulus to motivate students whether in-groups of the same gender or of both sexes.

It can therefore be concluded that for students to be more motivated to write, writing activities should cater for rich, numerous and integrated experiences that facilitate and enhance their understanding of how language creates meaning. This purposeful process of creation should occur within a positive learning environment whereby students receive numerous positive and constructive feedback as they communicate more in attempts to develop their ideas. Conduciveness to learn can also be enhanced if students are

empowered to learn. Once they are challenged to take charge, responsibility

for their own learning increases. They know that they determine the success

of their own learning.

As such, if they should succeed through peer collaboration and teacher

guidance, then the sense of achievement attained is a tremendous boost to their

self-esteem. Therefore, motivation to write and communicate increases and

further meaningful practice in identifying the requirements of the task,

forming a conceptual framework and ensuring cohesiveness will ensue. The

motivation circle of achievement furthering interest and performance thus

becomes a reality.

Challenges of the Information Age

With the challenges brought about by the Information Age knocking at

our doors, it becomes even more pertinent to consider the influence of

interaction between the writing environment and the writing process. Frizler

(1995) comments that classrooms have become borderless, thus making

possible interactions with people of different cultures and geographical

locations. The "virtual" classroom enables people communicate anywhere at

anytime. Communication is no longer restricted only to a small group of

people within the same location. In fact, communication can occur either

simultaneously or at different times or even both. Hence, avenues for

interaction and communication are tremendous.

In her study on the use of the Internet as an educational tool in ESOL

writing instruction Frizler (1995) found similar results as that of Edelsky's.

She agrees that meaningful interaction with the writing environment, purposeful writing and focus on meaningful content will increase students' level of motivation.. The most significant factor cited by students was that learning English online enabled them to be involved in actual communication with a real audience. As such, it provided exposure to English beyond the classroom. Having actual communicative purposes with a real audience also encouraged them to think. A student recorded his feelings in his learning journal as such:

> Hello everybody, does anybody have a feeling that our discussion grows more and more philosophical? When I looked at our subject, my first thought was "Oh my goodness, I can never handle it without a week's thinking, collecting facts and arguments and finally writing some hundred pages". Then I gave a new look at it and decided to make an attempt (p.4).

Another student also expressed his excitement at being on-line as such:

> I don't know if it's the topic, the excitement of being online, or a combination of the two, but the class dynamic is really strong already. After only one week of classes, the students are very motivated to write and ask each other questions about their postings. The discussion list was a good idea, I think, and one which will hopefully give the students a sense of class interaction throughout the course (p.4).

They were very enthusiastic about being pioneers in writing via networked classrooms and were awed that their communication was with international counterparts. They were also amazed at the speed and convenience that technology could provide. They felt that e-mailing provided

them more flexibility and control in determining when and how they study. They did not have to sit still in class all the time waiting to be taught. Instead, when they were inspired with new ideas, they could just go to the computer and express their ideas. As such, they could move around freely.

In addition, since they had to develop their own ideas for publication to a global audience, they naturally became more responsible for their own learning. Hence, the students were not merely told what to do and what to write, but were actively developing knowledge and sharing it with others.

An additional motivational factor for writing was the anonymity provided by on-line communication. Since no one knows the other person's identity, sex, age or race (unless the person concerned chooses to reveal it), on-line communication resulted in greater freedom and openness in expressing their ideas. They were less afraid of being ridiculed or embarrassed.

Other studies on networked writing classrooms have also indicated that the networked classroom can contribute to increased motivation. Khurshid et. al (1985); Hawisher and Selfe (1991); Collins (1993); Kang (1995); Johnson (1995) and Kroonenberg (1995) in Teoh (1996) claim that students are more motivated to write because of the novelty and sophistication associated with new technology.

In addition, e-mailing enhances the sense of purpose for writing as there is a real-life audience or reader other than the teacher. As such, they further contend that students spend more time writing and make more effort to write to their global audience. They are also more willing to teach each other, as the class becomes more student-centred. There was also an increase in teacher-student consultations as students have more direct access to the teacher.

Bearing this in mind, this study aims to look at whether collaboration in networked classrooms will facilitate or hinder the writing process and whether it motivates students to write and communicate further.

COLLABORATION IN NETWORKED CLASSROOMS

Knowledge has often been deemed an individual pursuit. Thus, the onus of constructing knowledge rests solely on the individual -- alone -- a task that daunts many an uncertain soul. However, learning does not have to be a lonely task all the time. In fact, occasionally, when the need arises, learning occurs better in interactional groups. This view is supported by Bruffee in Lundsford and Ede (1992), who proposes that our self-identity, what we know and write are largely due to our interactions with others.

Advantages of collaboration in networked classrooms

Equal opportunity to communicate

As Hanson-Smith (1997) observes, networking has provided writing teachers with a means to transform the pedagogy of composition as a product to a process. "Talk" naturally occurs during the pre-writing and while-writing stages. Being on-line, the discussion is not dominated by the fastest and most domineering speaker. Everyone has equal opportunity and time to form and present his or her ideas at his or her own pace.

Active and interactive learning of language

Another advantage of collaboration in networked classrooms is that language teaching and learning is no longer a passive process of learning the rules and grammar of the language. On the contrary, the purposeful and meaningful process of communicating and collaborating instils and encourages a more proactive and cognitive effort by the learner to assess, evaluate and employ strategies to achieve his writing goals.

Greater awareness of the writer-reader relationship

The Internet opens various opportunities for students to view the world from myriad perspectives in a real-world approach. With its access to e-mail, the World Wide Web, international projects, discussion forums, chat facilities, the Internet provides limitless opportunities for authentic collaborative experiences which encourage thinking.

In other words, the available network increases access to a diverse audience. Based on the assumption that awareness of reader is essential in order to help us revise our writing objectively, the feedback to opinions posted on the Internet can serve to modify and clarify thoughts regarding a subject.

Bernstein in Haring-Smith (1994) describes the value of peer feedback as such:

> When I am writing alone, I always visualise an audience, but I hear my own experiences .... It's kind of a closed loop -- there's no input from anyone else. When I am working with other people, there are other things that I must keep in mind: not just what the audience might say but what the person I'm working with is going to think of this line .... Working with someone else gives you another point of view. There is an extra voice in your head: that can make a lot of difference. Others can see things about what I am doing or what I am saying that I can't see. (p. 12)

As a result, the writer-reader/audience relationship becomes more apparent. The students begin to realise that becoming a good writer involves not only writing but also reading analytically. Thus, assuming both roles of writer and reader heightens the value of having an audience in the communicative process.

Inculcation of critical thinking skills

Gere in Haring-Smith (1994) recommends collaborative learning by rationalising that

> participants in collaborative groups learn when they challenge one another with questions, when they use the evidence and information available to them, when they develop relationships among issues, when they evaluate their own thinking. As such, collaborative learning does not focus on opinions or personal beliefs alone, but on beliefs accepted by a group as knowledge. In short, they learn when they assume that knowledge is something they can help create rather than something to be received whole from someone else.

Promotion of deeper comprehension

Vanderbilt (1996) claims that collaborative learning promotes thinking, communication and understanding. The level of comprehension referred to here goes beyond that of mere knowledge of a fact. It covers applications from the fact, and awareness of the possible connections of the facts to other related information. The web of concepts and ideas spun by a particular fact embodies a deeper understanding based on thoughtful learning, not spoon-feeding.

Hence, collaborative learning encourages the construction of deeper understanding. This is made possible when students interact and begin to utilise what they know. Then, they will learn to reflect on the thinking process, retrace their steps, analyse possible mistakes and plan further. In other words, students learn to value the thinking process, which no longer occurs in a vacuum but is facilitated by multiple responses. Most importantly, they are more likely to remember what is learnt as they associate new ideas to existing ones. By sharing with others what they have learnt, learning is further consolidated. Fulton (1996) thus describes the Internet as a tool, which enables

assignments to become windows and assignments that entice
students to go deeper and deeper into their own
understanding of the subject matter provide windows to
glimpse questions and contradictions that demand their
attention. There is a shift in focus from external
accumulation of information to internal
experience of making meaning (p.2).

The final product of their communicative and collaborative effort should therefore be one that fulfils the requirements of the task, is well developed with adequate insight into the topic of discussion, and presented with a clear sense of direction. Effective communication that results in the attainment of learning goals will therefore enhance the sense of personal satisfaction and achievement.

Sharing of cognitive load

Furthermore, Johnson, Johnson and Holubec (1989) postulate that the diversity inherent in collaborative heterogeneous groups naturally gives rise to conflicts and disagreements. However, they contend that disagreements should not be viewed negatively but should be regarded as catalysts for greater in-depth discussions from wider perspectives.

This belief is an extension of the Piagetian socio-constructivist theory that purport that social factors within a group will force students to resolve social factors instead of ignoring it. Thus, students will seek to clarify, explain and justify their stand. As each reflects and counter proposes alternatives, verbalisation and elaboration of ideas promote synthesis of information and internalisation of knowledge. Pieces of jigsaw that may previously be unrelated now begin to take shape as students progressively synthesise new input with existing knowledge.

With collaborative effort from each group member, the cognitive load is further distributed. The task therefore becomes less threatening and less ominous. As such, the diversity provided by Internet communication tools not

only injects challenge into learning, but also motivates students who may have become bored with familiarity that underestimates their ability and aspirations.

Opportunity to publish on-line

In addition, students have the opportunity to share and publish their ideas on-line for others to appreciate. As such, brainstorming, outlining, developing and organising ideas, thinking of the audience's expectations, and finding one's own voice or point of view are more likely to occur during the talk sessions. Peer editing of drafts further ensues as the collaborators attempt to create something new and original that will interest each other and those outside their writing community.

Creation of a positive learning environment

Group work provides vast opportunities for members to know each other better. Knowing that they will either sink or swim together, they will have to learn to trust each other, be more accepting and supportive. This learning environment promotes higher self-esteem as ideas and contributions from each member are given due consideration. Thus, through honing their social and interpersonal skills in considering and adjusting to others' perspectives, it is hoped that they will also be more positive towards the subject, the teacher and maybe even the school.

This contrasts greatly with the competitive atmosphere that pits one student against another. Working alone, striving to outdo others inculcates a selfish attitude. The mentality of "I swim, you sink" becomes detrimental.

On a lonelier plane is the student who works totally alone without interaction with others, striving merely for his own benefit. This individualistic attitude may limit opportunities to develop leadership and the ability to make decisions, create trust with other members of the class, communicate effectively and design suitable problem-solving strategies. Being accountable only to oneself and independent from others, his success or failure is also a personal triumph or tragedy.

Opportunity to train students to enter the workforce

Another benefit usually forgotten is working in groups trains them for the workplace. As Haring-Smith (1994) so aptly quips, "schools teach you to compete, but jobs require you to cooperate." Weir (1992) adds that through this "hands-on" training, students are more likely to show an increase in motivation, better comprehension of concepts as well as a greater willingness to deal with questions that may not have definite answers.

Limitations of collaborative work

Dickinson (1986) reports that the computer has indeed initiated a new social community that has changed the way that students interact. However, he warns that the success often expected by teachers depends to a large extent

on the success of the collaborative partnership. He fears that if partnerships are ineffective, writers will not be open to their peers' suggestions. Instead, resentment of the external critic will develop.

Haring-Smith cites Berkenkotter (1983, 1984) who agrees with this line of thought. In his case study on how students interact in their writing groups and whether writers improve their texts due to the interactions, Berkenkotter found that students' attitudes towards peer feedback were not all rosy. Some totally ignored the audience, some became oversensitive to criticism. Hence, feedback may not necessarily be of much benefit to students' writing.

Gere and Stevens (1985) do not deny that hostility may appear at the initial stages of collaborative work. However, they find that hostility normally gives way to a more tolerant acceptance and exchange of feedback. Once students (with the help of facilitators) get comfortable with each other, they will begin to clarify, to be more specific in their suggestions and consider incorporating peer suggestions into subsequent revisions.

Hermann (1989) further notes that students open to peer comments are able to anticipate their audience's possible questions regarding content and form. Therefore, peer comments are able to foster a shift from an introspective view to a wider enveloping extrospective perspective. This shift invariably acknowledges that the audience has the potential to create awareness of various strategies for revision. Thus, any study of the effects of peer comments on revision should recognise that it is not a cause-effect variable. On the contrary, the various factors that interpolate within the evolving social community are also of much influence.

Teacher's role

With so much emphasis on the learner, the teacher seems to fade into the background. On the contrary, the teacher as facilitator plays an important role in highlighting salient points in the collaborative process.

According to Harris (1995), the teacher has to first identify the collaborative objective. Then, based on the difficulty of the task, determine the group size and assign students to their respective groups. These groups are normally heterogeneous, either consisting of high-intermediate or low-intermediate students. After that, roles will be allocated to each member in the group to ensure proper monitoring and planning. Since the ultimate objective of collaborative work is to integrate the efforts of each group in achieving a common class goal, the teacher has to stress on the importance of interdependence. In addition, since the success or failure of each group rests on each member, the significance of each member's contribution cannot be denied or belittled. Hence, each member is accountable to the group and the class.

Depending on the nature of the task, the different criteria for success have to be clearly stated so that students know what is expected of them. The teacher also has to monitor the students' behaviour so that proper assistance can be provided at the right time. Evaluation will be carried out and each group asked to specify three positive factors that have facilitated their group discussions and one suggestion as to how they can improve their collaborative efforts. Finally, the teacher has to arrange for a review of aspects of learning

in terms of the clarity of content, effectiveness of collaborative work and choice of problem-solving strategies.

Criteria for successful collaborative learning

Collaborative projects should therefore attempt to fulfil the following criteria as proposed by Lundsford and Ede (1992):

1) provide time for students to get comfortable with each other and encourage leadership to emerge

2) divide groups according to subtasks which require various kinds of skills

3) provide for dynamic exchange of roles and negotiation on authority

4) instil a respect for others' ideas and knowledge so that each member believes it is worthwhile to share

5) provide for peer and self-evaluation during and after the assignment

6) encourage reflection and assessment of individual and group performance to identify mistakes and ways to improve

7) encourage constructive movement around the classroom

8) encourage self-directed learning in seeking answers by themselves to develop and support their ideas

Having established the value of collaboration in networked classrooms, let us now consider the medium of communication which enables this collaboration i.e. computer-mediated communication (or more popularly known as CMC), which involves e-mailing and real-time chat.

COMPUTER-MEDIATED COMMUNICATION (CMC)

Aspects of computer-mediated communication

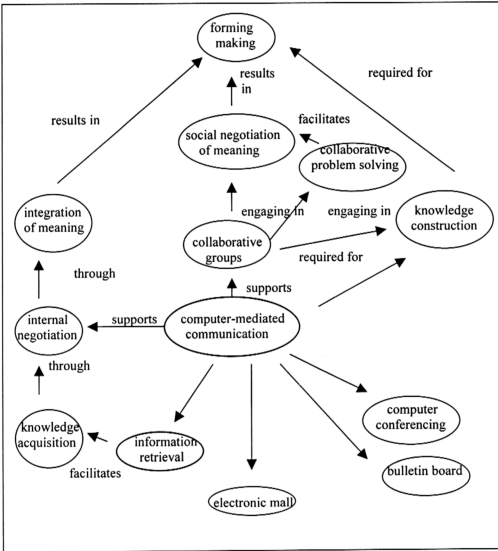Jonassen (1996) describes CMC as a mindtool represented in Figure 6:

Figure 6. Computer-mediated communication as a mindtool

(Jonassen, 1996: 148)

Computer-mediated communication covers a wide scope of functions

ranging from computer conferencing, bulletin boards, electronic mall,

information retrieval and even computer-supported collaborative group work. Its main role is as a mediator in the communicative process in extending interaction and collaboration across cultures, lifestyles and conditions unique to a particular community.

Students can explore on their own and retrieve information by seeking information from others on the Web in order to learn more from others outside their classroom. An example is the opportunity to inquire and learn from experts dealing with the NASA (National Science and Aeronautics) school project in the United States of America. This facilitates the acquisition of up-to-date knowledge. Students will also actively seek to understand what all the information before them can mean to them. Hence, internal negotiation of meaning can be gained through the integration of existing knowledge and present knowledge.

Another aspect of computer-mediated communication, which has received much hype, is computer-conferencing. This facility enables speakers from any site in the world with suitable equipment to hear and see each other as if they are all in the same room. As such, the personal touch is not lost as all parties involved can express themselves naturally and spontaneously.

However, the most important feature of computer-mediated communication as shown in Figure 7, is its ability to support collaborative group work. Computer-mediated communication promotes knowledge construction through collaborative problem solving whereby students work in groups, brainstorm and discuss ideas in depth and attempt to reach a sensible and meaningful conclusion. This problem -solving method encourages students to think by themselves as well as prompts them to think of other

alternatives based on their diverse backgrounds and knowledge. Thus,

contributions from group members are likely to enrich the content of

discussion as well as the quality of the eventual product.
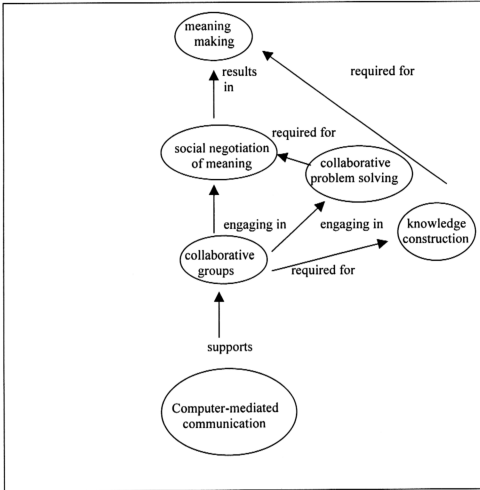

Figure 7. Computer-mediated communication as a facilitative tool for

collaborative group work.

(Jonassen, 1996: 148)

For the purposes of this study however, we will focus on its real-time

chat and e-mailing features that enable communication in the written form.

The real-time chat facility is synchronous. It allows simultaneous interaction

similar to computer conferencing. On the other hand, e-mail is asynchronous. Thus, it allows interaction at different periods of time.

The rationale for using computer-mediated communication is indicated by Warchauer (1997) in his study on motivational aspects of using computers for writing and communication. He claims that electronic communication facilitates communication, gives them a sense of achievement, empowers students, and enhances learning.

Motivational aspects of using computer-mediated communication (CMC) for writing and communication

CMC facilitates communication

By virtue of being networked and connected, computer-mediated communication provides the key to explore, discover and appreciate interaction with a borderless community whose cultures may be different from theirs. Thus, curious of the unknown, students can be motivated to share their experiences and learn from others.

In addition, Anderson (1995) claims that since there is no editor, the language found on the Internet is wholly authentic and natural. This provides exposure to real usage of language and a natural means of acquiring language. Warschauer, Turbee & Roberts (1994) agree strongly to the potential of using computer-mediated communication as they observe that networking also caters to autonomy, equality and learning skills among ESOL learners.

Since students need to write in order to communicate, Berge and Collins (1995) believe that the opportunities afforded by CMC can increase awareness of audience. Realising that they cannot assume the readers know matters specific to their culture or for that matter, what is on their minds, they will have to clarify and explain. This in turn encourages them to develop and revise their opinions and ideas in order to express themselves in an easily comprehensible and appealing manner. Thus, instead of writing merely for the teacher for assessment purposes, writing now takes on its actual function -- to communicate.

Ortega (1997) adds that computer-assisted discussions motivate students to explore and broaden their linguistic resources in order to meet the requirements of actual communication in a social context. As they attempt to negotiate meaning, their discussions will inadvertently involve expressing their opinions, clarifying and requesting for confirmation. Consequently, the amount of writing will increase as the students weigh others' opinions and consider whether to incorporate these ideas with theirs. If it is affirmative, then how can the integration be done? Such intensive discussions are bound to motivate students to discover means to better express themselves while assessing the substantial amount of input before them. As such, frequency in writing and feedback from the virtual community will encourage them to experiment with language and to proceed to more complex forms of writing.

Kelm (1992) further observes that computer-assisted discussion relieves students from the stress of contributing immediately to discussion. Hence, the students can determine when to respond when they are prepared to do so.

They can take their time to read comments, revise and edit, type responses and send their replies only when they are satisfied with their writing.

CMC empowers students

As the students desire to communicate, the responsibility to learn is more naturally placed on the learner. The will to learn will propel them to further take up the initiative to determine their learning paths. As they take hold of the direction for discourse, they gain a sense of personal power. They believe that computers can help them to overcome their sense of helplessness as they can rely on friends from the virtual community. The feeling of isolation often associated with individual writing is thus assuaged, as help is accessible anywhere, anytime. Once familiarity and bonding are formed within the virtual community, the students find more courage to speak up. Moreover, teacher talk is inevitably reduced. Hence, Pickering (1996) adds that student empowerment will inevitably transform the teacher's role from that the sole information provider and channel of knowledge to a facilitator and guide.

Therefore, the transformation of roles, facility in communicating and student empowerment will create a better learning environment where students are encouraged to be more independent, given opportunities to learn faster and to be more creative. This conducive environment opens diverse avenues for practising English.

CMC enhances learning

Computer-mediated communication also addresses a major problem in our society -- not a knowledge gap, but as Perkins (1992) puts it, a "how-to-use knowledge gap (p.3)". By nature of being a means for active and interactive learning dealing with issues and people from the actual world, CMC can be utilised to transform students' perspective on the acquisition of knowledge as a functional and relevant quest that will enrich and help them in the future. Intrinsically motivated, students are more likely to remember information from past and present learning experiences and relate them for future use. As such, the quest for knowledge is redeemed from the domain of merely passing or scoring in examinations. This implies that knowledge acquired will no longer recede into our catacombs of memory after that hurdle is over.

This supports the attainment of knowledge through "thoughtful learning" as proposed by American psychologist William James (1983) in Perkins (1992). He claims that

> "The art of remembering is the art of thinking .... When we wish to fix a new thing in either our own mind or a pupil's, our conscious effort should not be so much to impress and retain it as to connect it with something else already there. The connection is the thinking; and if we attend clearly to the connection, the connected thing will certainly be likely to remain with recall." (p.8)

Since electronic communication increases the amount of interaction that encourages brainstorming, reflection and revision of ideas, Warschauer proposes that electronic communication should function as a precursor to oral

discussions or as a prewriting activity that eases oral interactions into written output. Face-to-face discussions are still essential as they provide opportunities for in-depth questioning, confirmation, and paraphrasing that interlocutors cannot do without. The personal human touch of emotions and actual contact still stand as the pillars of meaningful communication.

CMC provides a sense of achievement

Meaningful interaction with an authentic audience transforms the writing task from an assignment unrelated to their lives, only for the teacher's eyes and red pen, never to be feasted on by others, to an opportunity to publish on-line. Where the traditional mode of assignment did not provide any avenue for publication, students often feel that the value of their work is reduced. It also gives them an impression that after the piece of work has been marked, it will lie buried, never to be read or appreciated by anyone else. Unless they are highly motivated to score for examination purposes, students tend to wonder why they should put in so much effort for a solitary piece of writing that seemingly deserves only a solitary end.

The networking culture motivates participants to contribute and not just passively receive information. As such, students will actively acquire, synthesise and present information with vested interest -- publication. What is notable is that there is an avenue for actual communication which leads to a product that considers the audience's age, interests, knowledge, level of maturity and proficiency in the language. Achievement gained by their own efforts provides an intrinsic sense of satisfaction that they have accomplished

something significant. This pride in their task and their product is like a shout

of triumph (Berge and Collins, 1995).

Other studies on motivation in networked classrooms

Similar to Warschauer (1997) and Frizler(1995)'s findings on increase in

motivation in networked writing classrooms, Brandjes (1997) observes that e-

mailing facilitates communication between the teacher and the students, thus

fostering a more supportive relationship. The teacher can participate in the

student-student discussions as well as lead and encourage the students. With

easy and convenient access to each other, facility in communication also

enhances student-student communication. The frequency in the exchange of

ideas, suggestions or criticisms increases and the students become more

involved personally. Therefore, the task is no longer merely a writing

assignment. Instead, it becomes a vehicle for expressing their ideas. They

have vested interest in the quality of the product.

Brandjes (1997) also emphasises that since their web pages will be the

medium for communication, the design of the web page should facilitate

comprehension. Since publishing on the Web means catering to an authentic

audience, the students will have to think of the audience as they write.

Subsequently, publishing provides a strong purpose and reason for

communicating, revising and refining their product. Moreover, since

publishing for a global audience reflects on them, this provides a strong

incentive for them to keep on refining their product until it achieves a

presentable quality that they can be proud of. As such, the process of writing becomes natural, out of a desire to improve.

In another study, Warschauer (1996) asserts that students tend to write more as they are given more time to reflect before replying. In his comparative research on the benefits of electronic communication as opposed to face-to-face communication, he notes that students feel free to express themselves, are more comfortable and more creative while communicating electronically. He also posits that while conversations are short with many requests for confirmation, electronic communication results in longer exchanges. However, the replies do not always adhere to a question-answer format. Exchanges may be expressions of ideas that further the point of discussion.

In addition, the level of formality in electronic communication is higher with the use of words like "in my opinion, based on my experience, therefore" which are not found in face-to-face communication. Sentences are more complex and regression to the mother tongue is minimal.

Thus, with computer-mediated communication, writing should no longer be a chore. Opportunities for on-line publication hitherto reserved only for better students will increase their motivation to experiment and proceed to more complex forms of writing. In addition, students tend to benefit "content-wise, language-wise and culture-wise (besides) learning how to use a new technology" (Vilmi, 1995).

Conclusion

Computer-mediated communication has the potential to facilitate effective and successful teaching and learning of English especially in the aspects of collaborative learning and student-centred activities.

It fulfils Raimes' (1993) requirements for effective teaching and learning of English. She believes that language teaching and learning should evolve around language as a means of communication with an authentic audience in the real world. The inherent implication that sufficient practice has to be provided for in order to communicate effectively with different audiences further subscribe to the belief that activities in the language classroom must encourage student participation and contribution -- a dual interaction rather than a one-way lecture. Students must experiment. As they actively explore, they will learn, understand and remember better. This will in turn facilitate a natural process of language acquisition.

Limitations of computer-mediated communication

Teachers should be warned, however, that these motivating aspects of using computers for writing and communication are significantly correlated to familiarity with e-mail and a basic grasp of computer knowledge. Furthermore, computer work must be an essential component of the lesson. To treat it as peripheral to the objectives of the lesson is bound to lead to frustration. Tools are meant to be exploited in order to maximise their potential -- not left to gather dust.

Hence, teachers, as facilitators of learning, can increase motivation by ensuring that students are skilful with computers and are given sufficient opportunities to use electronic communication tools. Computer use should also be incorporated as an integral part of the lesson. Ample facilities, administrative support and proper planning should therefore be ensured before embarking on Internet collaborative projects (Warschauer, 1996).

The value of computer-mediated communication is obvious. At the end of the day, students should be able to retain, comprehend and actively use knowledge. Knowledge is not a princess in the ivory tower so protected and adored to the point of being of no use to the outside world -- the real world.

COMPUTER-MEDIATED COMMUNICATION IN THE CONTEXT OF THE MALAYSIAN EDUCATIONAL SYSTEM

Current problem

In the recent smart school seminar, the Ministry of Education (1996) recognises that the present educational model does not prepare students for a dynamic and rapidly changing world that has embraced technology and evidenced an unrivalled impact of technology on society since the Industrial Revolution. Obvious implications of the encroachment of technology in facets of our lives are in the way we interpret our home, work, and human relationships.

Global scenario

With technology, the home expands its conservative role to that of office, shopping centre and chat rooms. Consumers can shop without stepping out of the house and friendships can be formed and strengthened via computers. These are the initial developments of technological applications. Considering the rapid rate of technological innovations, what may be new now may be outdated in the near future. Thus, we must equip ourselves now or be left behind.

Furthermore, with political boundaries becoming less distinct, collaboration is hailed as a potential means for shared benefit. The Multimedia Super Corridor (MSC) is an apt example of collaboration. Established companies that have distinguished themselves are invited to contribute, collaborate and invest with other up-and-coming local companies in technology-based applications such as on-line services, telemarketing and smart schools.

Therefore, as smart partnerships evolve in importance as a viable and efficient mode for achieving shared goals, educationists should also consider means of incorporating real-life and challenging collaborative activities into learning tasks. The litmus test for successful learning is whether the students are able to apply what they have learnt effectively and appropriately in their work. Since global trends partly dictate market demands, it is therefore imperative that our educational system improvises the existing curricula to live up to future challenges.

Possible solution

In conjunction, Smart schools, one of the flagships of the Multimedia Super Corridor vision, has most appropriately placed special emphasis on producing graduates who are proactive and skilful in information technology in order to cope with the information technology-enriched environment that has overtaken the world by storm. This will be made possible through a student-centred pedagogy that encourages students to initiate and develop their own ideas. The process that facilitates this development should therefore incorporate challenging activities that promote active and interactive learning.

In other words, the evolving learner-directed paradigm inherent in the Smart School philosophy encourages reflective, critical and creative learning which relegate rote-learning to a lower priority as a means to learn. More emphasis is now placed on discovery and exploration, with students taking the lead. This implies a reconceptualisation of the teaching-learning process from a teacher-centred to a student-centred classroom, a greater integrative role for technology in the planning of lesson objectives, greater emphasis on critical thinking and the creation of a conducive collaborative environment that enables active and interactive learning to thrive.

Eisenberg and Ely (1992) support the change in paradigm. They observe that the learner-directed paradigm can serve as a catalyst to encourage students to become actors on the stage of knowledge rather than be unresponsive audiences. Subsequently, the students will assume more responsibility for their own learning. Similarly, teachers in this learner-

centred classroom will become the directors, providing direction and synergising every actor's potential and abilities toward a common goal.

The shift in paradigm from a teacher-centred curriculum to a student-directed approach highlights an underlying emphasis on creating an open environment of inquiry and opportunities, which promote creative and critical thinking skills. No longer is information laid out on a platter. Instead, those who want to learn are provided with opportunities to utilise varied resources in order to find the required information substantiate their findings and present their opinions to others. This will encourage the students to comprehend the information laid before them in a deeper manner -- to figure out how to relate ideas which are relevant in order to synthesise and form a conclusive well-argued opinion. Thus, wider opportunities for active and authentic learning i.e. project and skills-based learning that simulate the real world will be given more priority to better equip students to be architects of their own present and future learning (Eisenberg and Ely, 1992).

Support from the constructivist learning model

The creation of a conducive environment for learning is in line with constructivist theories of learning which encourage the learner to construct his own perception of reality in relation to his past experiences and beliefs as well as through negotiation with others.

According to Jonassen (1994), meaningful construction of knowledge has to be facilitated by a learning environment that provides ample opportunities to interact with real-life situations through contextualised tasks

that simulate real-world contexts. Hence, the assigned task should focus on creating content and context-related construction of knowledge rather than mere reproduction of knowledge.

Jonassen posits that construction of knowledge must involve internal reflection and association of new experiences and knowledge with previous perceptions. In other words, the learner should query, predict, infer and relate past and new learning. The active reception of input implies active interaction with actual or simulated situations. Collaboration with others should facilitate this. Competition among learners is minimised as much as possible.

The three main constructs prevalent in any constructivist design process i.e. construction of knowledge, context and collaboration are similar to constructs raised by Hughey et al.(1983), Harasim (1989), Vanderbilt (1996), Johnson et al. (1989) and Harris (1995). Thus, the value of collaboration in networked classrooms is undeniable.

Hence, we should proceed with a sense of urgency in tapping the benefits made possible by technology integration to fulfil pedagogical objectives and to meet the demands of a dynamically changing society and world.

In view of this, the AT & T virtual classroom contest is chosen as the basis for experimenting whether collaborative activities in networked classrooms will create a supportive learning environment. It is believed that collaboration in networked classrooms will create an active and interactive learning environment that will reduce learner anxiety. This is because the students will have others to work with and to be the sounding board.

Furthermore, students are encouraged to voice their opinions, question others, disagree and try to come to a consensus in reaching the best solution to their learning task.   Hence, the quality of work done should be better.   In addition, the immediate assessor of their performance is not the teacher, but their peers.

THE AT & T VIRTUAL CLASSROOM CONTEST

Purpose and aim

An example of Internet collaborative activities that is of concern to this study is the AT & T Virtual Classroom Contest. This contest aims to provide primary and secondary school students anywhere in the world the opportunity and experience of collaborating on a worldwide basis using the Internet. The underlying belief is that global collaboration will have an increasing role in the future in solving problems, which will affect not only a country but other countries as well. Therefore, students should acknowledge the current developments by experiencing first hand the potential and drawbacks of international collaborative activities.

Activities

Each competing team will consist of three schools from different countries which will work together to create a web site. This web site will be assessed based on the extent the content appeals to an international audience,

the quality of the web design and the extent of collaboration among the three schools. The ultimate goal of the contest however, is not so much the final product, but the collaborative process that makes the product possible.

These three groups communicating electronically to accomplish a common goal is called a Learning Circle. They work co-operatively within a group and collaborative efforts among groups will be co-ordinated by a Circle co-ordinator. As such, electronic interaction offers a new means of learning co-operatively within and across classrooms.

In collaboration across classrooms as exemplified in the Learning Circle, three schools work as a team toward a common goal. The circle is first formed by selecting schools with similar topics. Introductions via the e-mail further ensue. Then, each class will propose its plan of action and post it to the Learning Circle for further discussions until a final consensus is reached (Riel, 1990).

In order to achieve their goal, the students will have to initially work co-operatively within the classroom. Firstly, the students must be assigned to subgroups and given specific tasks. Secondly, they will have to plan within their subgroups, execute their plan and report what they have achieved to the class. In the process, there may be little intergroup interaction as each group sets about accomplishing their different specific tasks. Sometimes, subgroups even tend to compete against each other (Riel, 1990).

The students will then have to collaborate with their group members and team members. Teachers from the three schools and a Circle coordinator assist them. Finally, they will proceed to creating the publication and later, sharing and evaluating their own and other team's product (Riel, 1990).

Advantages of networked environments

Decentralised control

Firstly, the teacher becomes a co-learner and trouble-shooter. The class teacher does not have total control over the course or direction of the project. In addition, no one knows how the project will finally develop and what the final product will be like. The uncertainty and challenge of rising up to the daunting task often excites students and teachers. This advertently heightens the significance of learning (Riel, 1990).

Furthermore, the Learning Circle promotes intergroup interaction. Achievement of each group contributes to the success of their shared objective. Hence, while each group is working on their task, they help other groups by providing feedback and suggestions. Most importantly, the structure inherent in electronic communication enables students to interact on a one-to-many basis without the possible chaos of face-to-face communication. Finally, since the teacher is a co-learner, the co-ordinator functions less as a controller. Instead, control is distributed and shared out among the students and their respective teachers (Riel, 1990).

Teachers' professional development

The teachers involved also stand to gain in terms of professional development. They acquire new knowledge as they explore and discover with

students. In addition, through sharing of problems and instructional strategies, teachers tend to form new teaching strategies to motivate students to learn. As the students show improvement, the effort put in is bound to receive recognition and praise from fellow colleagues and others in the educational circle. This increases the teachers' self-esteem and further encourages them to form professional support groups (Riel, 1990).

Considering the various advantages of networked environments, Riel strongly argues for social interaction, which is the basis of intellectual development. Since co-operative and collaborative learning provide for both social and intellectual development, teachers should initiate collaborative ventures with others and experiment with existing projects such as Cyberfair and Thinkquest. Thus, learning from one another not only educates the students, but also the teacher.

CONCLUSION

The explosive growth in global networking has enabled interaction on the Internet, which facilitates retrieval of information, delivery of instruction and endless opportunities for exposure to multiple means of input, proactive communication, and genuine attempts to create meaning.

If collaborative learning is to be taken seriously, then it will invariably influence the way classes are managed. Currently, the primary focus of schools is on the individual student's product. This emphasis on individual achievement precludes the wealth of knowledge and experience students can share.

Being able to carry out the main tasks of the teacher however does not mean the computer will replace the teacher. Cameron (1995) argues that "only an actual instructor can teach students to utilise computer-based tools to further their educational goals." Thus, it is not the teacher who becomes redundant but rather outdated teaching philosophies and approaches that no longer prepare the students to function effectively in the real world.

Thus, the best way to exploit features of both the traditional and virtual classroom is to combine them. There is no best method in teaching. By stepping into both worlds, we can mine the extensive amount of information available as well as the endless opportunities of real communication with actual objectives and authentic audiences in the virtual classroom, and utilise the social aspect of meeting instructors and peers in the same classroom (Frizler, 1995).

In conclusion, since the potential of exploiting technology as a catalyst to create a stimulating, fun and open environment have proven to be rewarding, integration of technology into the learning process should be considered to complement traditional learning methods. Educators will inevitably have to provide alternative means of learning to the conventional classroom in order to keep up with the rapidly changing world surrounding us. If this transition does not take place, then increasing use of technology in the world surrounding the students will dampen their motivation to learn. Therefore, technological innovations must not overtake pedagogical practices so much so that learning becomes uninteresting and lacking in relevance to the students' needs. If this were so, then learning will no longer serve its purpose.

Let us no longer hesitate in fear of a technology meant only to propel us. Let us instead be prime players of the future. We must be at the frontier and dare to be positively different.