to give the students a general understanding of how a computer operates and the general applications of computer. PrintShop is introduced to motivate the students and to help them overcome "technophobia", as it is fun, interesting and easy to use.

WordStar and dBase are also introduced as they are useful applications softwares that illustrate the real-world uses of computers. Though it is desirable for teachers to know more than these two (e.g. spreadsheet like Lotus 1-2-3 or MultiPlan would be 'equally useful') it is the ability to learn these types of programmes that is emphasized throughout the course. It is hoped that by teaching students two software packages, they will learn how to learn other packages on their own when the needs arise later.

The CAI portion includes learning about the different modes of CAI, their uses, strengths and weaknesses; evaluation and selection of courseware and hardware; and finally the principles of courseware-authoring and actual authoring using an authoring system, the Private Tutor.

BASIC programming is introduced to teach students the logic of programming and to enable them to write simple programmes. It is believed that though these teachers will not be expected to teach programming, they need to understand the nature of programming to communicate with students or teachers who are involved in programming activities. More important, if they have the interest or inclination, some knowledge of programming will go a long way in enabling them to work with computer experts and programmers in the design and development of CAI courseware.

The course is perhaps over-ambitious. All topics get some attention to a limited extent. Under the constraints of the existing curricular structure, it was felt that breadth should be given priority over depth of content as the main aim of the course is computer literacy for teachers with the emphasis on learning how to learn.

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Articulating Teacher And Pupil Learning Outcomes

by

Sim, Wong Kooi

(A) Introduction

In his typically humorous, yet vivid, style, Cosby (1989) relates his fumbling experiences with "the only subject that no one has ever been able to study for," only to discover a brave new world of marital bliss where he "realised how important it is for each partner in a marriage to make adjustments. One of mine is agreeing to live in a minimum security prison."

The following excerpt will perhaps illustrate the characteristic Cosby wit and warmth.

"I tell you all this at the start of the book so that you will have a historical fix on the man you are hearing from. A man who did not learn the truth about human reproduction until the late forties; and when I finally got this comical information, it was from the University of the Gutter and not from my grade school hygiene class, where even the Pope would have been bored. I remembered a day when I was ten or eleven and an older boy said with a casual smirk, 'You know why my sister got thrown out of sewing class?' 'Because she needlesthe teacher,' I replied. 'No, because she couldn't mend straight.' The joke flew right by me, for it seemed to me that mending was only one part of sewing. Even if his sister couldn't mend straight, she still might have been able to do a lovely job of cross-stitching."

The above anecdote was chosen in order to provide staging points for raising three interrelated issues. The first issue is whether the formal school system caters for important pupil learning outcomes and whether the preparation for "love and marriage" or the development of a sense of humour should be included. If the answer is in the affirmative, the next issue is whether important pupil learning outcomes can effectively be brought about by instructional processes in schools or whether certain learning outcomes are best left to the "University of the Gutter." If the answer is in the negative, the final issue is whether teachers can learn more effective ways of bringing about learning and whether it is useful to relate teacher learning outcomes with important pupil learning outcomes.

This paper will therefore endeavour to answer the three main questions, which are:

(a) What are desirable pupil learning outcomes?
(b) How are pedagogical processes related to pupil learning outcomes?
(c) How should teacher learning outcomes be articulated with pupil learning outcomes?

Fortunately, some of the answers may be found in three recent papers which were presented in Singapore on separate occasions. Although none of the papers were supposed to address the questions specifically, much of what Biggs (1990a), Bennett (1991) and Shulman (1990) have presented are very pertinent to each of the respective questions, and to some extent also to the other questions.

To be sure, reference will also be made to other relevant literature as well as to some of my own personal perspectives. One perspective which I have found to provide a useful framework for examining pedagogical phenomena, including learning outcomes, is a "pedagogical model" which was in fact presented at an ICET Conference some two decades ago (Sim, 1970). This model will be outlined after the three questions are addressed in the final section on "A Singapore Perspective," where reference would also be made to some research and practice issues in Singapore.

(B) What are desirable pupil learning outcomes?

In his paper, Biggs (1990a) states categorically that "Effective learning is deep learning; ineffective is surface" and that "surface approaches lead generally to undesirable and deep and achieving to desirable, outcomes" (underlining inserted). The concept of "surface" and "deep" approaches to learning were first proposed by Marton and Saljo (1976), but Biggs has been able, through his extensive research, to characterise these approaches as well as another approach which he calls the "achieving" approach more specifically. For example, in another paper, he makes the following distinctions (Biggs, 1990b):

"The surface approach is based on extrinsic motivation: the student sees school as a means towards some other end, such as obtaining a better job or just keeping out of trouble.

...... A student who adopts a surface approach tends to:

(a) hold a quantitative conception of learning;
(b) see the task as a demand to be met
(c) focus on the concrete and literal aspects of it, such as the actual words used rather than their meaning;
(d) see the components of the task as discrete, unrelated to each other or to other tasks;
(e) rely on memorisation of these components;
(f) avoid personal meanings the task might have;
(g) worry about failing; and
(h) be resentful of the time taken."

"The deep approach is based on interest in the subject matter of the task
...... A student adopting a deep approach tends to:
(a) hold a qualitative conception of learning;
(b) see the task as interesting and personally involving;
(c) focus on underlying meaning rather than on literal aspects;
(d) integrate the task components with each other and with other tasks;
(e) relate the task to what is already known, read widely, and discuss with others;
(f) theorise about the task, and form hypotheses about how it relates to other items of knowledge;
(g) see the task as a possibility for enriching own experience; and
(h) find learning emotionally satisfying."

"The achieving approach is based on a particular form of extrinsic motive: the ego-enhancement that comes out of visibly achieving, and in particular through high grades...... A student adopting an achieving approach tends to:

(a) hold an institutional conception of learning'
(b) see high grades and marks as important, and be competitive about obtaining them;
(c) see it as important to meet formal requirements as to presentation, time of completion, interpreting the task, but otherwise be prepared to cut corners;
(d) see it as important to be self-disciplined, neat and systematic, and to plan ahead, allocating time to tasks in proportion of their importance;
(e) concentrate on what counts, avoiding interesting side tracks, which waste time;
(f) like highly structured and public learning contexts."

Biggs (1990a), in his presentation, points out that "An approach to learning comprises a motive and a related strategy; that is, what you want out of learning will determine how you go about learning". Table 1 portrays the three prototypical approaches and their cognate components.
Table 1

Three Prototypical Approaches to Learning
(Biggs, 1990 (a))

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>Motive</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface:</td>
<td>Extrinsic: avoid failure but don't work too hard.</td>
<td>Focus on selected details and reproduce accurately.</td>
</tr>
<tr>
<td>Achieving:</td>
<td>Achievement: compete for highest grades.</td>
<td>Optimise organisation of time and effort. (&quot;study skills&quot;)</td>
</tr>
</tbody>
</table>

Biggs uses the term "metalearning" to refer to the specific metacognitive processes relating to the students' awareness of their motives and control over their strategy selection. It would appear that a desirable learning outcome is for students to develop metalearning which corresponds to the development of a deep, rather than, surface to learning. In an examination-oriented society like Singapore, it would be unavoidable that many students would also develop an achieving approach at the same time.

In terms of learning outcomes, Briggs (1990a) has this to say:

The product of learning may be described quantitatively (how much is learned), qualitatively (how well it is learned), and institutionally (which draws variously on both, according to how the teacher awards marks). Affective outcomes relate to how students feel about their learning, their beliefs about their own efficacy are crucial in determining the quality and extent of their future involvement in learning.

His paper however focuses on improving the quality of learning, for which he suggests the use of the "SOLO Taxonomy", where SOLO stands for Structure of the Observed Learning Outcome (Biggs and Collis, 1982). The taxonomy helps to characterise learning outcomes in terms of levels of ascending structural complexity, with the learner handling increasingly abstract aspects of the task as learning progresses.

Five levels of complexity are distinguished:

(a) Prestructural. Preliminary but inappropriate engagement in the task, as the learner is misled by an irrelevant aspect belonging to a previous and simpler mode of operating.

(b) Unistructural. The learner picks up one or very few relevant aspects of the task.

(c) Multistructural. The learner picks up several aspects of the task serially, but does not then integrate them.

(d) Relational. The learner now integrates the parts so that the whole has a coherent structure and meaning.

(e) Extended abstract. The learner generalises the coherent structure to take in new and more abstract features, representing a higher mode of operation.

According to Biggs (1990b), the "end-point" for the ordinary school leaver "would in SOLO terms be the relational level of learning for important topics at the end of compulsory schooling, and the multistructural level for less important topics. In science, for example, it might be thought reasonable that the ordinary school leaver about to enter society should need only to 'know something about' acids and alkalis (a multistructural level), but to 'understand how' the human body works in concrete terms (a relational level). It then becomes a matter of selecting what topics should go into the syllabus and determining how one would know whether the appropriate level of knowledge or of understanding has been reached by a sufficient number of students to say that teaching — and learning — has been successful."

In order to assess the attainment, or otherwise, of desirable learning outcomes, it is important that assessment items, which can exert a powerful "backwash" effect, correspond closely to the levels of learning outcomes being assessed. Biggs (1990a) proposed the use of SOLO taxonomy-based "ordered-outcome" items, as illustrated by the example shown in Fig. 1, which was administered to Form 1 pupils in Hong Kong (Biggs, et al., 1988).

In designing the sub items, the following criteria were used, which correspond to each SOLO level:

1. Unistructural: Containing one obvious piece of information coming directly from the stem.

2. Multistructural: Involving the use of two or more discrete and separate pieces of information found in the stem.
Figure 1

An Ordered Outcome Mathematics Item (from Biggs, et al, 1988)

<table>
<thead>
<tr>
<th>FORM 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCHOOL A</td>
</tr>
<tr>
<td>(a) Unistructural</td>
</tr>
<tr>
<td>(b) Multi-Structural</td>
</tr>
<tr>
<td>(c) Relational</td>
</tr>
<tr>
<td>(d) Extended Abstract</td>
</tr>
</tbody>
</table>

3. **Relational:** Using two or more pieces of information, each directly related to an integrated understanding of the information in the stem.

4. **Extended abstract:** Requiring the use of an abstract general principle or hypothesis which can be derived from, or suggested by, the information in the stem.

Notwithstanding the importance, and the exciting nature, of research connected with learning outcomes, as has been conducted by Biggs and his associates, the main preoccupation has apparently been with cognitive learning. There is in fact a dearth of research on affective and psychomotor learning outcomes.

(C) **How are pedagogical processes related to pupil learning outcomes?**

Defining learning as "an active, constructive and cumulative process that occurs gradually over a period of time," Bennett (1991) stressed that "children do not come to any lesson empty-headed; they come with partial schemas. The teacher's job, then, is to find effective ways for children to modify, extend or elaborate their schemas. Indeed, we can define learning in these terms — the extension, modification or elaboration of existing cognitive schemas."

Citing a number of studies on children's preconceptions or misconceptions, he concluded as follows:

"What the body of research into children's alternative frameworks has shown is that they often hold unorthodox conceptions about a wide range of topics taught in school; that these conceptions shape how they make sense of new information, thereby often exacerbating learning difficulties; and that learners often find it difficult to modify their conceptions, particularly in areas like science, where they prefer to hold onto their intuitive ideas."

Another recent conception of children's learning which have important implications for classroom practice was derived from Vygotsky's concept of the "zone of proximal development," which refers to the gap between what an individual can do alone and unaided and what can be achieved with the help of more knowledgeable others. According to Vygotsky (1978), "Learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers." Hence, Bennett (1991) concluded that "Children as learners are now conceived as 'social beings', not 'lone scientists'. The social setting of learning is now seen to be crucial both in terms of the quality of teacher-pupil and pupil-pupil dialogue. As such, modes of organising classrooms are sought which allow for co-operative endeavours and which celebrate the rigour of talk."

The implications of these conceptions for classroom practice were further illustrated with a variety of studies in respect of the four processes in a "simple model of a teaching cycle", namely "planning and preparation," "presentation," "implementation," and "assessment." (Bennett, 1991).

The most crucial part of planning and preparation, according to him is the match, or mis-match, between task and child, which assumes understanding by the teacher of children's conceptions and misconceptions. His own studies (Bennett et al., 1984) have borne out the professional judgements of Her Majesty's Inspectorate who observed that "the level of demand and pace of work is more often directed toward children of average ability in the class, and the high attainers in the class tend to be under-estimated and low attainers over-estimated."

In order to provide optimal learning experiences, the teacher also needs to be aware of the phase of learning the child is in. (Bennett, 1991) Three phases were suggested. The initial phase involves the memorisation of facts, often from rote learning. In the intermediate phase, the learner begins to see relationships among conceptually isolated pieces of information. In the terminal phase, the knowledge structures and schema formed in the interme-
In terms of presentation, Bennett (1991) has this to say: "Our recent studies have highlighted how infrequently teachers of children of any age indicate the purpose of activities. They are very good at telling children what to do, but not on telling them why they are doing it. This is important, since the manner in which the task is specified confers importance to certain aspects of it and ignores others."

Pupils tend to make their own judgements on what is required, such as by basing it on what is assessed and rewarded. For example, "we have often observed in creative writing sessions that teachers called for a really exciting story with lots of imagination, but actually assessed in terms of length, neatness and grammar." (Bennett, 1991)

Studies related to implementation do not seem to provide a very encouraging picture. For example, although the National Curriculum Guidance in English curriculum has encouraged the use of meaningful teacher-pupil and pupil-pupil talk as an instrument for learning, "the current practice in Britain is ostensibly based on the individualisation of learning. In reality, children tend to be grouped by ability, but research on these groups presents a sobering picture. One study reported that most of the talk was between members of the same sex, even in mixed sex groups; that only half of the talk was concerned with their work, and that conversations tended to be short. It concluded that seating children in groups "is no guarantee that they will talk freely about anything, let alone their work." Almost identical findings were reported by a larger study of junior children (Galton et al., 1980). It was found that whilst most children sat in groups, for the majority of the time, they worked as individuals on their own tasks. Whilst in the group, pupils spent on average two thirds of the time interacting with no one. Only about one sixth of the time did they talk to another child, but most of this talk was not about the work. In this study it was exceptional to find a group working a cooperative task, that is, one requiring a group outcome. In other words pupils worked in groups, but not as groups." (Bennett, 1991)

In terms of teacher-pupil interaction, Galton et al. (1980) have observed that "While the 'typical' teacher spends most of the lesson time interacting with pupils ...... each individual pupil, by contrast, interacts with the teacher for only a small proportion of his time. And most of that interaction is experienced by the pupil when the teacher is addressing the whole class." A more recent statement by Galton (1990) did not seem to be too encouraging, for according to him "the lessons I drew from the experience (as a participant observer cum school teacher for five years) are that changes in teaching style, in particular, are not likely to shift radically outside a five- or six-year time scale."

If indeed teachers need to match classroom tasks to children's schemas, the use of diagnostic assessment should, according to Bennett (1991) be crucial. But he observed that "What, in fact, is often found in contemporary classrooms is a great deal of assessment, some informal and unrecorded, and much assessment characterised by ticks, crosses and brief comments. There is a lack of diagnosis, and this is often accompanied by teachers concentrating on what children produce, for example, the number of completed sums, rather than on how it has been achieved. Yet both are necessary for diagnosis."

In his review of contemporary research on teaching and learning in the primary classroom, Bennett (1990) concluded that "Research... has enhanced our understanding of teaching and learning in primary classrooms. The teaching styles studies identified the strengths and weaknesses of general teaching approaches in relation to both cognitive and affective outcomes; the opportunity-to-learn studies provided more specific information on the impact of learning various time allocations, such as time devoted to the various subjects in the curriculum time spent on task; and in so doing highlighted hitherto neglected issues such as curriculum balance, and optimal ways of teaching children of differing levels of attainment."

The review by Brophy and Good (1986) has also concluded optimistically that "The last fifteen years have produced an orderly knowledge base linking teacher behaviour to achievement... (and this has served to) demolish the myth that teachers do not make a difference to pupil learning." Although they focused on pupil achievement, the state-of-the-art has provided valuable clues as to the effective learning. For example, an important conclusion is that "Effective teachers working at higher levels should be able to do the following:

(a) develop apt analogies/examples that will enable students to relate the new to the familiar or the abstract to the concrete;

(b) identify key concepts that help to organise complex bodies of information;

(c) model problem-solving processes that involve judgement and decision-making under conditions of uncertainty; and

(d) diagnose and correct subtle misconceptions in students' thinking.

(D) How should teacher learning outcomes be articulated with pupil learning outcomes?

Knowing that teachers can make a difference and that certain teacher behaviours are more effective than others is one thing; it is yet another thing whether teachers are able to learn, display and sustain the more effective behaviours. Shulman, who has written extensively on the kinds of knowledge that teachers should have such as propositional, case and strategic knowledge (Shulman, 1986) highlighted some important pedagogical ways of knowing at the last ICET World Assembly (Shulman, 1990).

His concept of an effective teacher must surely correspond to one who...
is an autonomous, balance and committed professional who uses flexible methods of teaching while taking cognisance of the range of individual differences of learners in terms of their different ways of viewing concepts and the differences in their affinity for different ways of representing concepts. He has, for example, underscored the point that "no predetermined, preordained, one right method, one right model, one right puzzle is likely ever to work." He therefore suggests looking at pedagogical ways of knowing in terms of (a) subject matter, (b) representations of subject matter, (c) the process of learning, and (d) the process of teaching.

In terms of subject matter, Shulman (1990) stresses that "a teacher should know how to think about a discipline pedagogically, how to look at a text in a flexible, multiple-represented way." In knowing the subject matter in a flexible and eclectic way, a teacher must not be "enslaved by but one way of looking at our subject."

In order to build the many bridges between student knowledge and teacher knowledge, Shulman (1990) suggests that the teacher should "possess and actively develop a repertoire of representation," which would include "analogy, metaphors, examples, demonstrations, visualisation and stories."

As for the process of learning, "the teacher's knowledge of a learner is to enable to get inside the learner's head and see from the learner's perspective." Such knowledge, in Shulman's view, would help the teacher to anticipate and forestall preconceptions and misconception of pupils.

Finally, in terms of the process of teaching, Shulman (1990) suggests that teachers should learn to use methodological flexibility and eclecticism to link method and content for a range of objectives and a diversity of student characteristics that they are likely to encounter. Teachers should therefore not be chained to a single approach.

It is interesting that Shulman also included a moral dimension in his pedagogical way of knowing. Thus, according to him "Without a moral commitment to the belief that all human beings are born with a capacity to learn, teachers will begin to invest their pedagogical energies only in those who they deem likely to succeed. In that prediction lie the seeds of a self-fulfilling prophecy."

We in the schools and the institutions of teacher education have as large an obligation to inculcate vivid images of the possible in the minds of future teachers as we have to instruct them in methods of classroom management and approaches to student assessment."

The moral obligation of teacher educators to help future teachers to realise this moral obligations to their pupils should also be accompanied by attempts to facilitate their learning of a range of methods that are likely to facilitate pupil learning. One way of articulating teacher learning outcomes with pupil learning outcomes is to ensure that teachers learn pedagogical ways of learning. Formal teacher education programmes should at least strive to ensure that prospective and practising teachers are exposed to a knowledge base consistent with the latest research findings and collective, conventional wisdom of teacher educators.

While curriculum change in teacher education which takes seriously into account recent developments and thinking on both teacher and pupil learning outcomes are likely to be on the increase, efforts at systematically reviewing and compiling the desirable knowledge base for teachers would be urgently needed. One such commendable effort is the volume by Reynolds (1989). In particular, the chapters on "Learners and Learning" (Anderson, 1989a) and "Classroom Instruction" (Anderson, 1989b) should indeed be required reading not only for beginning teachers but also of practising teachers. Anderson's (1981a, 1989b) "organising ideas" which result from distilling the findings of recent research are particularly valuable. The following are some illustrative examples:

<table>
<thead>
<tr>
<th>Organising ideas on learners and learning</th>
<th>Organising ideas on classroom instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 3: Knowledge structures change as a result of information received through instruction and experience that leads the learner to construct new knowledge; prior knowledge structures are always the basis for the construction of new knowledge structures.</td>
<td>No. 4: Lessons in which learners perceive links among main ideas are more likely to contribute to content learning than are lessons in which links among main ideas are less easily perceived by learners. One way that teachers can facilitate students' perceptions of links among main ideas is through well-organised lessons and presentations.</td>
</tr>
<tr>
<td>No. 6: The capacity for self-regulation develops over time, and is influenced by the social environment, especially interactions with more knowledgeable adults or peers during problem solving efforts.</td>
<td>No. 9: Students' motivation is affected by the classroom social and task structure.</td>
</tr>
</tbody>
</table>
A Singapore perspective

Being a pragmatic society with very limited resources, including human resources, many of Singapore's directions or re-directions in teacher education are of necessity influenced by, or even derived from, a variety of inputs from overseas. Thus the three presentations by Biggs, Bennett and Shulman, constitute invaluable inputs to our continuing efforts to improve teacher education as well as educational research.

The eclectic approach also presupposes that we do not necessarily confine our sources of ideas in trying to articulate teacher and pupil learning outcomes to only the three presentations, however important we have found them to be. As a matter of fact, many interesting new perspectives on learning and related processes have emerged in the recent literature (e.g., Cormier and Hagman, 1987; Phye and Andre, 1986; Ramsden, 1988; Schmeck, 1988; Weinert et al., 1987 and Weinsten et al., 1988). It would definitely be beyond the scope of the present paper to review these studies, let alone incorporate and integrate the many ideas into a coherent framework. Suffice it to say that it is part of the normal process among my colleagues and I to assimilate or accommodate new ideas in both our teaching and research.

A recent state-of-the-art review of research related to learning outcomes in Singapore (Tay-Koay, 1991) revealed that such studies have been increasing steadily, especially during the past decade or so. The bulk of the studies were concerned with cognitive learning outcomes, with only a few on effective learning processes, although effective correlates were often used to predict cognitive learning outcomes. Most of the studies were either correlational ones, with a mix of predictor variables and mainly achievement as the criterion, or experiments which investigated the effects of some novel teaching/learning approach, such as the use of computer aided instruction, science enrichment activities, and higher order questions. Only very recently have there been studies which attempt to explore in greater depth the processes associated with learning outcomes, such as children's errors and misconceptions, learning and thinking styles, and learning strategies and metacognition. Again, it is beyond the scope of this paper to discuss the findings of these studies except to make the observation that, by and large, many of them apply in the Singapore context. Most of the studies serve to delineate the specific relationships, which, if different from those observed in other countries, help to confirm the extent to which unique aspects of the educational system, such as the highly examination-oriented and highly streamed situation, have produced rather unique outcomes.

While explaining the importance of borrowing ideas from the international arena, rather than re-inventing the wheel, it should also be pointed out that, where appropriate, indigenous frameworks have been developed for the purpose of taking into consideration areas of special interest. To illustrate this point, I will end this paper by briefly describing two models which I have been using.

The first is a pedagogical model which posits that pedagogical phenomena invariably involve five omnipresent, interactive and generic elements, namely Content (C), Objectives/Outcomes (O), Student(s), Teacher(s) (T), and Environment (E), as shown in Fig. 2. Thus, even when, for convenience, we choose to focus on fewer elements, for completeness sake, the other elements would eventually need to be taken into account. Each element is generic and can therefore refer to a variety of situations. For example, S could refer to an individual student or a group of students, or a student in a formal, informal or non-formal learning situation. Each element can also have sub-elements or characteristics. For example, the characteristics of S could be categorised into various attributes, experiences and styles. Four pedagogical processes formed from focusing initially on three of the elements are of particular interest. (The other elements should subsequently be taken into consideration for the sake of completeness). They are:

(a) Planning, formed from T, C, O, and C, for, initially at least, if involves the Teacher's consideration of Objectives and Content vis-a-vis his own strengths and weaknesses.
(b) Instructing, formed from T, S, and C, for in the instructional process, the Teacher is interacting mainly with his Students vis-a-vis the Content of the lesson.
(c) Learning, formed from S, C and O, for in the learning process, the Student is interacting with Content hopefully with some Objectives or expectations in mind.
(d) Evaluation, formed from T, S and O, for at some stage, evaluation entails having the Teacher and/or the Students compare the actual versus the intended learning Outcome.

These four pedagogical processes correspond with the four components in Bennett's (1991) teaching cycle. namely, (a) planning and preparation, (b) presentation, (c) implementation and (d) assessment. Some six years ago, the Institute of Education revamped its teacher education curriculum by introducing a Practicum Curriculum, which has the four processes, together with four other processes, namely Managing, Organising, Socialising, and (Teacher) Learning, as the core processes (see Fig. 3), around which theory and practice are supposed to be articulated.

Another perspective from this model is the conceptualisation of teacher education in terms of the juxtaposition of a number of the basic model configurations. as shown in Fig. 4. The teacher-in-training plays a dual role of teacher and student in this situation. Thus, in articulating teacher and pupil learning outcomes, it is important to compare the interactions in situation 1 with those in situation 2 or situation 3. Since the teacher-in-training, S1 is likely to be affected by the previous experiences, either as a student (So) or
The second model which helps to conceptualise the global needs of individuals and society is shown in Fig. 5. From this conceptual framework, it would be possible to delineate the desirable learning outcomes on the assumption that the needs of individuals as well as of society should be catered for.

Four mainly types of needs for the individual are labelled as:

(a) **Intellectual needs**, not only in terms of the basics, but also critical and creative thinking.

(b) **Industrial needs** in terms of awareness of the world of work and work ethics, including attitudes towards re-learning.

(c) **Intrapersonal needs** in terms of physical, mental and moral health as well as enduring interests.

(d) **Interpersonal needs** in terms of being able to relate socially, empathetically and wisely.

For society, the four types of needs correspond to the concerns of the government ministries other than that of Education. They are:

(a) **Security needs** in terms of personal safety from external or internal threats and legal protection, which are taken care of by the Ministries of Defence, Home Affairs and Law.

(b) **Stability needs** in terms of economic viability and productive employment which are taken care of by the Ministries of Finance, Trade and Industry and Labour.

(c) **Sustainability needs** in terms of personal and environmental health and quality of life, which are taken care of by the Ministries of Health, Environment and National Development.

(d) **Sensitivity needs** in terms of community welfare and interpersonal and international relations which are taken care of by the Ministries of Community Development, Communications, Information and the Arts, and Foreign Affairs.

Some of these needs are in fact captured in two songs, Y.A.S. and N.A.Y., which are shown in Annexes 1 and 2 respectively. The challenge before us is not only to spell out the desirable pupil learning outcomes based on their individual teacher learning outcomes in terms of pedagogical ways of knowing that would help transform their subject matter and pedagogical knowledge base into meaningful learning experiences for their pupils. Needless to say, we are a long way from adequately articulating teacher and pupil learning outcomes.
Figure 3

Some Pedagogical Processes

Figure 4

Teacher Education
Relationship Between Individual and Societal Needs

**Society**
- Security
  - Defence
- Stability
  - Finance
- Sustainability
  - Health
- Sensitivity
  - Community Development

**Education**
- Intellectual
- Industrial
- Intrapersonal
- Interpersonal

**Individual**

(F) References


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Annex 1

Y.A.S.

Chorus: Y.A.S. You are Special!
You are an individual.
Not just a boy or a girl.
Nor normal or monolingual.
Y.A.S. You are Special!
You are an individual.

1. Your needs are intellectual —
   To see beyond the visible:
   To think of things unthinkable.
   It's really Y.A.S., it's real.

2. Your needs are industrial —
   To optimise your potential:
   To change with changes changeable.
   It's really Y.A.S., it's real.

3. Your needs are intrapersonal —
   To love things eternal:
   To be healthy, not just physical.
   It's really Y.A.S., it's real.

4. Your needs are interpersonal —
   To learn how to be sociable:
   To be open, yet not gullible.
   It's really Y.A.S., it's real.

---


Annex 2

N.A.Y.?

Do you only satisfy individual needs?
Or, do you try to satisfy individual needs
With a view to satisfy societal needs?

How do we build a secure society?
To its total defense, we all should rally.
Subversives at home would really have to worry.
As justice is assured by the laws of the country.

How do we build a stable society?
With financial reserves strong and steady.
For trade and industry, we have a global strategy.
Our labor force is committed to productivity.

How do we build a sustainable society?
Where we all stay healthy in mind and body.
We need to ensure our environment is clean and tidy.
Good housing and utilities are available aplenty.

How do we build a sensitive society?
We'll develop and care for all in our community.
To communicate, we'll apply information technology.
With other countries, we'll live in peace and harmony.

Critical Role of Writing And Thinking in Student Development

by

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(A) Introduction

Let me say at the outset, that as a generalized empirical observation, today's students (and probably yesterday's students as well) invest minimal cognitive and physical energies in completing term paper assignments.

While there are probably any number of explanations varying from discipline to discipline and campus to campus, we suspect in the first instance, a pronounced lack of understanding regarding the critical importance of writing skills and critical thinking. There is in our estimation failure in perception of these skills as a valued part of learning.

Placing this in a wider context, or real-life scenario, we contend, students approach writing assignments with a collegiate history (or is it an attitude) that has provided a myriad of ready-made responses for dealing with course required term papers and the like.

Our reasoning goes something like this: throughout the student's academic career, he/she has acquired and been shaped by (a) myths "... term papers aren't that important." (b) rituals "... another boring paper. I'll feed back what he/she gave us in class plus some of my readings." and (c) customs "...I'll knock it out during spring (or winter break) while I'm on vacation in Fort Lauderdale."

Assuming some validity to the above, it is not too difficult to understand student's perception of writing assignments as boring, wasted energy and of questionable value.

In an era where students are not afraid to criticize what they view as unproductive work assignments, our reputation is on the line. And this should be reason enough to review our teaching methods and priorities, as they converge with student values, motivations and aspirations brought to class.

And, part of that review ought to be an assessment of the degree to which reasoning and problem-solving, thinking and writing has high priority in teaching outcomes. Obviously, if students are to succeed in higher education and in the complex life that follows, every rung of the human mind must be cultivated.

In this respect, Goff's (1983) comments are instructive; he notes, "the process of thinking, creating, questioning and synthesizing are often not actively cultivated."

To be sure, there are organic connections between classroom work and outside-the-classroom writing assignments. But the importance we attach to