

## INTERDISCIPLINARY EDUCATION: A PROPOSAL

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### SINOPSIS

*Siswazah universiti-universiti kita sekarang ini semakin kurang keupayaan mereka untuk menentang dan memahami serta mengatasi masalah-masalah yang lahir dari keadaan alam sekeliling yang bertambah kompleks.*

*Antara lain ini disebabkan oleh bentuk dan susunan sukatan pelajaran yang ada pada masa sekarang ini di universiti-universiti kita. Kandungan mata-mata pelajaran adalah disusun secara 'vertical' dan bercorak yang tertentu. Keadaan seperti ini pasti tidak menyegarkan dan tidak akan menimbulkan minat. Yang dinamakan 'liberal education' atau pendidikan luas itu cuma suatu rumusan kacok yang dibina dari beberapa aneka bidang pelajaran.*

*Kertas ini mencadangkan suatu model untuk mengkaji dan membina semula peta alam pengetahuan kita dengan kaedah antara-discipline yang berkamil. Model ini diharap akan meluaskan lagi perspektif untuk merancang bentuk-bentuk karikula baru yang lebih berkesan.*

### SYNOPSIS

*The products of our Universities are becoming less and less adequate to meet the demands imposed by an increasingly complex and rapidly changing environment.*

*This is partly due to the current curricular arrangements and, more fundamentally, to the vertical, compartmentalised ordering of knowledge which is typical of our university syllabi. Even the so-called liberal education programmes are merely patchwork made up from disparate disciplines.*

*A proposal is here made for an attempt to review and reconstruct our knowledge maps from an integrated multi and inter-disciplinary perspective. This opens up channels for new and refreshing curricular designs.*

### INTRODUCTION

- i) There is a lack of interdisciplinary communication and meaningful integration among the various disciplines under the present university curricular arrangement.
- ii) This is responsible for the kind of compartmentalised mentality that often characterises a large majority of our graduates and undergraduates.

- iii) Such mentality does not breed responsible and mature citizenship; it hampers the broad-minded aptitude of being able to appreciate and understand the complexities of the situation with which we are faced.

In an environment of more rapid and fundamental change and increasing complexity than ever before the products of the University are becoming less and less adequate.

In several respects it has become impossible for a student to come out of his 3 or 4 or more years (as the case may be) with a whole picture that has any validity and to be able to comprehend and evaluate the things in the environment which affect him.

What is implied above is not the liberalising of the sciences or the 'mechanization' of the Arts and Social Sciences. It is something more fundamental. Each and every discipline in the campus has its own method and approach to enquiry. What is significantly common among these disciplines is that the enquirers are human beings. Being so, they are all symbol users and manipulators. There are universes of enquiry with various systems of symbols. But there is one symbol system that is more or less common to all; and that is ordinary language. We communicate usually in terms of this language. If we are interested in talking about or special discipline and its symbol system we have to translate or re-interpret specific symbols in terms of a common symbol. Otherwise, it is impossible to have any interdisciplinary communication at all. To put it another way: there are different approaches to knowledge (epistemologies) which characterise the general field of human knowledge. The specialist abstracts a portion of this field and magnifies it. This is useful provided he is aware or conscious of abstracting—i.e. he knows he is abstracting and knows at what level he is doing so, or how far away he is from the factual territory. And he must be able to integrate his knowledge within the wider scope of human knowledge so that he can be aware of the human dimension of his knowledge—the role, purpose and function of his activity.

### **The Problem of Orientation to the Increasing Complexities**

The crisis in higher education, of which informed students are becoming aware, is demanding action on several fronts. As the advancing waves of students arrive, certain old problems and issues must be resolved, or at least squarely met. One respect in which the University is open to attack is the quality of the University graduate and the sort of leadership which he is able to give. In an environment of more rapid and fundamental change and increasing complexities than ever before, the products of the University are becoming less and less adequate.

The inadequacy of the graduates is not so apparent at the practical, vocational, and professional levels as it is in his work and responsibility as a citizen, in his ability in human relations and his integrity as a person. He seems especially unable to evaluate his problems, which are frequently of a global dimension; in his confusion he tends to oversimplify; he is especially inept in his reception of information and as a communicator. He is neither sufficiently flexible nor stable; he is impulsive; he says both too much and too little; his mental health is often a matter of genuine concern; in the areas of human problems his imagination and ingenuity are limited.

Much the same may be said of his instructor—perhaps even more emphatically. In the process of becoming a specialist in a narrow segment of knowledge, the future professor has remained innocent of the harmonies of the universe about him; his knowledge outside of his specialty is verbal and not genuine. As he becomes more narrowly specialised, or as he becomes more theoretical, he becomes less competent in general. As the over-verbalised intellectual he is particularly insensitive to the sensitive and dynamic youth before him; he often does not know how to release the creative power for learning present in his classroom group; he is often wedded to a very limited methodology of instruction; he relies too exclusively upon the lecture, quiz, and research paper; he is usually stuffy and uninteresting when he does lecture his captive groups; he often carries a heavy load.

The chief reason for this condition appears to be that fundamental core of liberal learning as it exists and is taught in this strange new world of science and technology which man has brought about. But paradoxically it is a world of which human beings are not prepared. With the continuous multiplication of new data, the university curriculum has had to become more and more fractionated in some areas and more and more abstract in others to encompass the results of research. In several respects it has become impossible for a student to come out of his three or four more years (as the case may be) with a whole picture that has any validity and to be able to comprehend and evaluate the things in the universe which affect him. The floods of verbalism and high-order abstractions which he is asked to digest in his courses leave him with much half-true if not false information. What impact that has made tends to build an orientation around words instead of around the realities with which he must deal.

### **Consequences of Verbal Fragmentation**

In his effort to build word-structures and definitions which satisfy his instructor the student tends to ignore the vast and deep reaches of the

silent and invisible. Both the smaller and the greater dynamic structures of the universe escape him. As he becomes enamoured with words he tends to talk more and more and say less, and to get farther and farther away from his world of reality. The brighter students tend to become theoretical and over-verbalised, the other students simply learn to manipulate enough appropriate terms to pass their courses, and they are left with vast areas which they do not communicate at all.

Competency and mental health require that thinking should be predominantly concrete and specific, and that there be a secondary effort at all times to connect the concrete data with their philosophical implications. However the current standard curriculum constantly accentuates a split between the two. Physics and Biology are too frequently taught by persons who do not see or care about their philosophical implications; the social sciences and the humanities are far too verbal; the fine arts are often completely split from their roots in the natural and social sciences. There are no organising and unifying bases for the whole curriculum which will permit the thoughtful student to make sense out of his universe and evaluate his own experiences and those of others.

### **Ordering the Universe Relationally**

Because of these intricate problems which face the student and his instructor, we are proposing an Inter-Disciplinary programme to develop methods toward meeting the situation above described. The chief aim of the programme would be to initiate the rebuilding of the general education aspects of the university curriculum to meet these needs. The members of the programme would work on the problem of integration in their areas, and they would prepare the results for publication. New channels of communication would weld the basic disciplines together. The members of the programme, for example, would work upon the misunderstandings and the poor communication between the social anthropologists and the political scientists, the biologists and the physicists, etc.

Such barriers between disciplines may possibly give away under the approach here described. The members will work toward variables which cut horizontally through all knowledge and information from the smallest entities in the atom to the greater entities beyond the heavenly galaxies. These variables as outlined by L.L. Whyte, Alfred Korzybski, with implications from Albert Einstein and others, seem to be:

1. process and change, but with
2. order, sequence, patterning,
3. generation and regeneration, formation and reformation,
4. function, inter-correlations, simultaneities, and parallelisms, which in turn imply

##### 5. regularities, dynamic structure, and relations.

All of these would focus upon the conditions which make for the adjustment, survival, and development of man.

This ordering of the universe at all levels, these "invariances under transformation," may, for example, be seen in the perpetuation of the species; in the relation of the histamines to the allergies; in the climates of different regions; in the rise and fall of nations, governments, and cultures; in the careers of men; in the problems of the family, industry, and education; and apparently in the actualities with which man must deal from astronomy to zoology.

When in most of his courses the information and data are presented from the standpoint of these variable-constants the student will gradually become able to put his course experiences into a coherent dynamic whole. He will become oriented to relation and change; he will have a basis to transcend definition and verbalism; he will be able to ascertain probabilities and to evaluate. In thus disciplining him virtually to transcend himself he may come to search for relation (many at invisible and inferential levels), to see things whole, the better to blossom into his competency and creativity.

#### **The Analogue Factor**

In the intense effort to specialize scholars have tended to stress minute differences. The marvelous advances in physical science application today testify to their effectiveness. But this vertical stratification within disciplines has at the same time brought a neglect of the equally important training to see similarities between the various disciplines. The atrophy of the ability to think horizontally has impaired whole dimensions of the relating, symbolizing, and evaluating functions.

The ability to make comparisons and to establish correspondences seems to be the most basic behaviour for predicting, inferring, and adjusting. But to see across departmental boundary lines one must carry comparing to a different order, to the level of analogy. Analogue thinking enables persons to relate entities horizontally; it makes possible the connecting of dynamic structures from the atom to the cosmos. To produce symbols and to communicate requires the thinking process not only to compare and to see simple analogies, but also to go to the level of figurative analogy and metaphor. Symbolising activity thus has a direct relation through analogical thinking to comparison. Comparison directly links man's adjustments through his unique verbalising capacity to the physical world.

The human nervous system serves as a bridge or communicating manifold between these structures and the content which emerges in languages

and other media. What happens between sense-impression and speaking, between experience and the symbolising thereof, determines much of human achievement and adequacy. The individual should understand something of these processes and be on guard against disorders in his abstracting, comparing, and symbolising. In so doing he must almost incessantly be checking his output of communication with the intake of information. This behaviour must be ordered with a main focus upon the relations between verbal map and factual territory instead of upon language as such.

Literature and the arts may be viewed as analogies to the basic fact-structures of the universe. Poetry, drama, music, pictures, with their various orders of abstracting, coincide more or less to the silent pictures and assumptions which were abstracted from the original "outside" fact-territories. "Truth" is the degree of correspondence between map and territory, between "art" and those life experiences from which it is drawn.

### **A Laboratory on Integration Methodology**

The orientation desired is probably not possible without an understanding of the nature and functions of communication and symbolising behaviours in oneself and others from whom the individual receives information. Language must be seen in its function of promoting human adjustment and human relations. It must be seen as a part behaviour which goes on in the processing of information and data through the human nervous system of one person to the nervous system of another. The student must know how to deal with some of the hazards and interferences to this process in himself and others. He must become able to unravel confusions and misunderstandings as they range from the stages of observation and silent assumptions to the states of reports to summaries and abstractions of still "higher" order. Otherwise he becomes so entangled verbally that he never sees the actual events and relations with which he must deal. He must particularly develop a scientific attitude towards the structure of language and other communication media so that he will constantly compare and check these to the fact-structures which they purportedly represent. He must be aware of the difficulties which occur in the transmission of the cultural heritage not only from one person to another person but from the past generations to the present generation.

The membership of the Interdisciplinary Programme would be made up of from 20-25 faculty members from the natural sciences, social sciences, the humanities, law, medical sciences and extra-mural studies. Members from these areas would form the Academic Work Committee\*. Certain

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\* The Committee is made up of the leading members of the various faculties and disciplines. It forms the main core of the Interdisciplinary Educational Project. Its activity consists largely in drawing out broad outlines towards an integrative discipline. Even at this level (even more so because of it) the AWC's orientation is

members would be selected to serve as observers, critics, and evaluators at each session. Undergraduates should be encouraged to attend these sessions.

The sessions might be held during the short term vacations, lasting through the vacation period. There will be lectures by members of different faculties and disciplines. These lectures are centred largely on integration methodology. Each session would require some 3–4 hours—a one-hour lecture followed by a 2–3 hour Interdisciplinary Forum (which includes discussions, demonstrations, visual aids, and other means of extensional application of integration methodology to diverse disciplines). (Obviously there will be short breaks in-between).

Each of these sessions might be described as an Interdisciplinary Unit (or ID Unit, for short). Each Unit could be made up of about 5 different faculty members and about 20–30 undergrads from diverse disciplines. Faculty members are to draw out in advance the areas to be explored, providing the basic readings for their respective areas. The aim is to encourage students to put things together and reorient themselves at new levels. The Faculty members in the ID Unit would go through a growth corresponding to that which they would desire in their students. Each session, besides other things, would be series of procedures to get the student to link his knowledge and himself and others together in new and enlarged patterns of meanings. These would be managed in such a way that the student would become a much more intensive researcher than now occurs in his learning efforts.

### **Example of an Interdisciplinary Unit**

The Faculty members (being specialists in their respective disciplines) would bring their areas into relationship analogically. For example, the physicist would be asked to make one of the most fundamental structures in his area the basis for building the unit. For instance, this might be polarization, or gravitation, or magnetism. If polarization were selected as the basis for the unit the biologist would be asked to find several of the analogues structures he could to this in plant and animal life. He should be able to find structures where positive and negative, attraction and repelling, were predominant characteristics. The social scientist or historian would be asked to find similar structures in the area of human organization, economics, and cultural dynamics; the psychologist would

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geared to problem-solving rather than directing operations. Its development depend a great deal upon the issues and problems that arise out of the ID Unit. It gathers the reports and impressions of members of the Unit as well as those of the appointed observers, critics and evaluators assigned to each Unit. However, the Committee reserves final say on matters of policy and the shape that the revised curriculum is to take.

be asked to find corresponding structures related to personality behaviours; the literature specialist would find plays, stories, epics, essays, and novels wherein this structure was represented in the plots, situations, or otherwise; the art and music specialists (if any) would bring in further corresponding relationships from masterpieces in their area; the professor of philosophy would add much in making the unit a harmonious whole.

The whole unit would be conducted in such a way that there will be a maximum of self-teaching. Students should be expected to come out with their own plays, sociodramas, monographs, poems, panel discussions which demonstrate a higher synthesis and deeper insights. These creative projects should focus on three questions:

1. What is important in this for me and my career?
2. What is important for us?
3. What is important in the relation revealed in this unit for human survival and development?

At the end of every session each person would write and leave behind a report of his reactions for summary and presentation at the beginning of the next session. The ID Unit would probably tend to take over more and more of its own management as it progresses. In its operation there would be much stress on non-directive methods for the development of its members.

### **Building New Avenues and Bridges**

The lectures at the beginning of each session would fall into three tightly coherent series with each series building upon the other. In the first series the emphasis would be upon the arranging of curriculum material and subject matter in a new organization characterised by emphasis on process and change, on the connectedness of events particularly at the invisible and inferential levels, by the rhythms, patternings and cycles from the smallest to the greatest entities accessible to investigation and understanding. What are the conditions—from the atoms and galaxies, from part to whole and whole to part—which make for the release of energy and life? For growth, survival, health, and development? For intelligence and imagination? What events accompany other events, what sub-cycles make up the larger patterns and repeat themselves at varying rates? In all of the reaches from the sub-animal to animal to human groups? For the small and the great cataclysms of nature, for growth and catastrophe in human affairs? There probably are enough data to give at least tentative answers to these and many, many other questions if properly organised and emphasised.

These data would be put together through the intergroup communication which would be put into effect in the ID Units. By putting the natural



scientist, humanist, and social scientist into systematic communication with each other the relationships as illustrated in such questions as those above may become more and more clear and significant. As specific data are brought to bear upon each other newly observed factual relationships will assume definite structure and coherence.

### **To Help the Student Open His Mind**

Yet the desired communication among the various subject-matter specialists probably cannot be obtained without a rather vigorous disciplining in communication understood and practised in its deepest and vital functions. Language and symbolising would be explained in their total setting of personality and groups as behaviour making for human adjustment and human relations. Stress would also be put on the semantic discipline whereby the obstructions to comprehension and evaluation of information due to inherent static language structures are explored. There would be a disciplining of ability to check language structures against their fast-structures with a further basis in making for an orientation to reality instead of an orientation towards words in the classroom. That which happens in a human nervous system as it takes in information, organises and evaluates it, formulates messages and transmits them to another nervous system, will also be described. The semantic hazards, the self-induced difficulties to perception, the nature of misunderstandings, confusions, and communication barriers would be a special concern both as subject matter and in the operation of the ID Unit. The lectures would apply directly to the problems of study, organization, and communication in academic exercises and papers and quizzes as well as the whole learning experience. The main overall focus would be upon the methods whereby the student becomes able to pull himself together in regard to the whole range of information which he must assimilate; the flexibility he needs for a complex changing world; the stability and character which must be developed if he is to lead effectively and wisely.

The second series of lectures would bear mainly upon methods for the release of potential power in the classroom group and University community for learning. Group dynamics will be joined to the relational and general semantic methodologies of the previous series of lectures. Communication in group development would be the central approach. The non-directive group methods and methods for organizing a group to control, direct, and evaluate itself will be presented. The silent, hidden, and unconscious factors in communication and agreement-making will be farther explained with particular concern for the problems of the members in the ID Unit.

The third series will emphasise methods for solving problems of communication and learning in the contexts given above. Much of the work

presented at this time will depend upon the problems which have arisen in the tasks of curriculum reorganisation which the Academic Work Committee have encountered. A considerable stress will be given to the methods of testing the rating which will need to be assembled and devised for the new curriculum being developed.

The methodologies underlying the above project will be derived and synthesised from a number of the great leaders in the behavioural sciences and philosophies of the past half-century. This include the general semantics of Alfred Korzybski<sup>1</sup> and his students; the information theory of Norbert Wiener<sup>2</sup> and Claude Shannon<sup>3</sup>; the group dynamics of Kurt Lewin<sup>4</sup> and his students; the sociometry and sociodrama of J.L. Moreno<sup>5</sup>; the non-directive individual and group psychology of Carl Rogers<sup>6</sup>; the communication theories derived from R.C. Cabot<sup>7</sup>, George Herbert Mead<sup>8</sup>, Susanne Langer<sup>9</sup>, Earnest Cassirer<sup>10</sup>, Charles Morris<sup>11</sup>, Clyde Kluckhohn<sup>12</sup>, Margaret Mead<sup>13</sup>, and the communication approach to mental health of Jurgen Ruesch<sup>14</sup>, and many others in the same deep stream.

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