Unit – 5 . Issues in Curriculum Development

Introduction

Twenty-first century classrooms challenge traditional, teacher-centered curriculum to meet the increasingly diverse needs of students and make the required increases in achievement gains. School violence, diverse student needs and populations, educational renewal, and technological advances place demands on teachers in areas for which they were formally held accountable. With teacher educators, problems occur when teaching styles conflict with students' learning styles, often resulting in limited learning or no learning.

Altan and Trombly (2001) offer learner-centeredness as a model for countering classroom challenges because of its viability for meeting diverse needs. Learner-centered classrooms place students at the center of classroom organization and respect their learning needs, strategies, and styles. In learner-centered classrooms, students can be observed working individually or in pairs and small groups on distinct tasks and projects. The transition from teaching the entire group to meeting individual learner needs involves extensive planning and task-specific classroom management.

Teacher-centered vs. Learner-centered paradigms

Teacher Centered	Learner Centered Paradigm Learner
Knowledge is transmitted from professor to students	Students construct knowledge through gathering and synthesizing information and integrating it with the general skills of inquiry, communication, critical thinking, problem solving and so on
Students passively receive information	Students are actively involved
Emphasis is on acquisition of knowledge outside the context in which it will be used	Emphasis is on using and communicating knowledge effectively to address enduring and emerging issues and problems in real-life contexts
Professor's role is to be primary information giver and primary evaluator	Professor's role is to coach and facilitate Professor and students evaluate learning together
Teaching and assessing are separate	**Teaching and assessing are intertwined**
Assessment is used to monitor learning	**Assessment is used to promote and diagnose learning**
Emphasis is on right answers	Emphasis is on generating better questions and learning from errors
Desired learning is assessed indirectly through the use of objectively scored tests	**Desired learning is assessed directly through papers, projects, performances, portfolios, and the like**
Focus is on a single discipline	Approach is compatible with interdisciplinary investigation
Culture is competitive and individualistic	Culture is cooperative, collaborative, and supportive
Only students are viewed as learners	Professor and students learn together

TEACHING-CENTERED versus LEARNING-CENTERED instruction

Concept Teacher	Centered Learner	Centered
Teaching goals	Teaching goals	Students learn: o How to use the discipline o How to integrate disciplines to solve complex problems o An array of **core learning objectives**, such as communication and information literacy skills
Organization of the curriculum	Courses in catalog	Cohesive program with systematically created opportunities to synthesize, practice, and develop increasingly complex ideas, skills, and values
Course structure	• Faculty cover topics	**Students master learning objectives**
How students learn	Listening • Reading • Independent learning, often in competition for grades	Students construct knowledge by integrating new learning into what they already know • Learning is viewed as a cognitive and social act
Pedagogy	Based on delivery of information	Based on engagement of students
Course delivery	Lecture • Assignments and exams for summative purposes	Active learning • Assignments for formative purposes • Collaborative learning • Community service learning • Cooperative learning • Online, asynchronous, self-directed learning • Problem-based learning
Course grading	• Faculty as gatekeepers • Normal distribution expected	**Grades indicate mastery of learning objectives**
Faculty role	Sage on the stage	Designer of learning environments
Effective teaching	Teach (present information) well and those who can will learn	Engage students in their learning • Help all students master learning objectives • **Use classroom assessment to improve courses** • **Use program**

Student-centered learning

Student-centered learning, also known as learner-centered education, broadly encompasses methods of teaching that shift the focus of instruction from the teacher to the student. In original usage, student-centered learning aims to develop learner autonomy and independence by putting responsibility for the learning path in the hands of students. Student-centered instruction focuses on skills and practices that enable lifelong learning and independent problem-solving. Student-centered learning theory and practice are based on the constructivist learning theory that emphasizes the learner's critical role in constructing meaning from new information and prior experience.

Student-centered learning puts students' interests first, acknowledging student voice as central to the learning experience. In a student-centered learning space, students choose what they will learn, how they will learn, and how they will assess their own learning. This is in contrast to traditional education, also dubbed "teacher-centered learning", which situates the teacher as the primarily "active" role while students take a more "passive", receptive role. In a teacher-centered classroom, teachers choose what the students will learn, how the students will learn, and how the students will be assessed on their learning. In contrast, student-centered learning requires students to be active, responsible participants in their own learning and with their own pace of learning.

Usage of the term "student-centered learning" may also simply refer to educational mindsets or instructional methods that recognize individual differences in learners. In this sense, student-centered learning emphasizes each student's interests, abilities, and learning styles, placing the teacher as a facilitator of learning for individuals rather than for the class as a whole.

subject-centered

The subject-centered designer divides the curriculum into nice and neat subjects such as maths, science, history, literature, etc. This structuring of the disciplines is for practical reasons. It organizes the curriculum into basic concepts that are combined based on what they have in common. The essential knowledge of each area is gathered together to be taught to students.

Where the division of the curriculum stops depends on its purpose. Any expert in education knows that subjects overlap and the division is often arbitrary. In addition, every subject can be further divide into smaller parts. For example, English can be broken down into writing, reading, speech, grammar, and more.

A major criticism of this design is the lack of integration or horizontal articulation. The learning is compartmentalized and the students often never see the connections across subjects. In addition, the subject-centered design does not take into account the needs and interest of the students. The textbook is made by experts in the field who already know what knowledge and even experiences a child requires.

Despite this, the subject design is by far the most popular approach. It is easy to do and practical. It's appropriateness needs to be left to the educator who is trying to help their students.

The Subject-Centred Curriculum is the traditional model that was laid out by Ralph Tyler in 1949 in his seminal book, Basic Principles of Curriculum and Instruction. Also called the Knowledge-Centered Curriculum, it is the most widely-used method of instruction. The knowledge-centered curriculum is an academic curriculum where students are expected to acquire knowledge of their world as a foundation for

their adult life. This type of curriculum lays greater emphasis on the subjects themselves rather tha the children. Students are expected to gain mastery of subject matters from academic disciplines that hav been predetermined by a panel of experts. These are prescribed for the students without much regard to their actual interest or point of view.

The curriculum is organized around content units and the sequence of what is taught follows the logic of the subject matter. Knowledge and skills are taught sequentially over time and students have to remember these for the purpose of examination or an interview for a white-collar job. The teacher in a subject-based curriculum is seen as a scholar who will be using a variety of teaching strategies to share their knowledge. A report by the Partnership for 21st Century Skills emphasizes on the necessity of teacher-led instruction to help students gain knowledge and be able to build upon it in an organized manner. As regards the environment in which the subject-based curriculum takes place, it is the traditional school classroom where discipline is maintained and students are often expected to remain seated at their desks. There is a clear academic focus and stress is laid only on intellectual development.

This type of curriculum ignores altogether the personal and social development of the child Assessment within a subject-centred curriculum takes the form of formal examinations and standards-based assessment. With these, teachers and students are able to evaluate the progress made. In addition, program administrators can use the results of traditional tests to justify their programs' achievements. In a 2004 study on core knowledge curriculum and school performance, Wedman & Waigandt found a strong correlation between students enrolled in the Core Knowledge program and high test scores in all subjects regardless of ethnic or economic profiles. The longer the students were enrolled in the program the more they outperformed their peers enrolled in non- Core Knowledge schools.

In recent decades, student centered pedagogy has provided serious challenges to traditional —lecture -and-test□ modes of education in colleges anduniversities. Advocates of student-centered pedagogy generally proceed from theconstructivist position that maintains that learners construct theirunderstandings through their actions and experiences on the world. Student-centered thinking has spawned a burgeoning interest in the use of a variety of different active learning methods in and out of the classroom. These includecollaborative learning, experiential learning, problem-based learning, and a varietyof otherpedagogical methods.However, the theory and practice of student centered pedagogy is not without its problems.

Problems and issues in curriculum development

"Problem"

• The word "problem" is connected with theword "solution". A problem is somethingnegative that needs to be solved. Some badthings that happen cannot be called "problems"because they are unsolvable.

• . A problem is something that has a clearanswer.

"Issue"

• "Issue" is associated withdifficult decisions and disagreements. A issueis something that causes debate and dividespeople.

Curriculum development

• Problems of planning an effective andintegrated curriculum are not simple.

• A good curriculum involves out of harddedicated and intelligent work conducted oncontinuous bases.

• A curriculum development is continuous work. It musthave philosophical psychological, social and Economic basis

.• The curriculum planners have to investigate carefullyand thoroughly the nature and qualification of thosefor which curriculum is to be planned.

• Fundamental principle of curriculum planning is"student must either be selected to fit the planned curriculum or curriculum must be planned to fit thelevel of the students enrolled

• Developing or revising a curriculum one isfaced a number of problems and issues. Thecurriculum is planned set of activities.• The process of curriculum is a web of moraland intellectual purposes and beliefs whichultimately define the political economic andsocial arrangements of any society..

• If the society is relatively stable, the plannercan answer of many crucial questionsunderlying the curriculum

• Its simple to shape the personality andcharacter of an individual.

• In highly dynamic societies curriculumproblems are more complex.

• Decisions about aims, goals objectives,selection of major areas of curriculum.

• Choosing learning experiences and evaluationprocedures are reached after input of various groups.

• The people concerned in curriculum planninggathering without conflicting points onfoundations. They may be able to work faster

.• If personals involved have no agreement onthese. This would create confusions.• Societal and ideological problems facingcurriculum have broadened the cultural andphilosophical dilemma.• These may have indirect but powerful relevancewith curriculum.

Ideological problemsfaced in curriculum development

• Authority• Poverty• In-equality• Indoctrination• Ill health• Suppression of inquiry and expression• Regionalism• Provincialism• Nationalism

Societal and ideological problemsfaced in curriculum development

• Dissolution of family• Ecological imbalance• Prejudices• Alienation• Threat• Fear• Control• Coercio

War and greed

Institutional and Instructionalproblem

s• Apathy• Discipline• Individual differences• Science and high technology• Basic standards• Jobs• Instructional packages• Teacher effectiveness• Life skills• Drug abuse Education

Societal problems

• Death Education• Family life• Sex Education• Consumers Education• Accountability• Global Education• Mind and body study• Feminist studies.

Economic Problems

• Change in curriculum, needs financial support

.• New teaching materials are required

.• Teachers are needed to be provided with in-services training and equipped with newteaching materials textbooks are to be revisedto fulfill the changing needs of the society.

• Supportive personal are required to assist theteachers for effective implementation of newcurriculum designs.

Political Interference

• It would be tempting, to argue that educationshould be taken out of politics. An educationalwill expect political parties to clarify theirgeneral educational aims and policies, whichconcern broad social issues.• Every person coming into power brings withhim his vested interests and few educationalplans for the nation, in such atmosphereeducationist is likely to suffer from frustration

Lack of Teaching Material

• Many of the educational programmers are fail due to lack of teaching materials. Thesemester system was introduced in theinstitution of higher education.• It faced many problems due to lack oftextbooks and other teaching material.Though teacher too, takes a little interest butmajor factor for its failure is shortage ofinstructional materials.

Lack of In-services Training•

When new curriculum was design are broughtinto practice the teacher are not properlyintroduced to new learning actives and teachingstrategies.

• If teacher are to be mobilized in support ofcurriculum change, both initial and in-serviceteacher education must convince them for theircrucial role in promoting innovation.

• It provide a place where teacher could findsolutions to practice they have encountered inthe classroom.**Teacher Reluctant to Accept Change**

• It is universal phenomena that teacher areconsidered to be conservative.

• They have reasons for beings unwilling to changetheir approaches, not least because they have aninvestment in knowledge and skills, which lend tobe devalued by the passage of time

• They face the natural human temptation to resistany change which may render their stock in tradeobstacle. Secondary always opposed newcurriculum as they are supposed to pay moreattention to new concepts and ideas

Make social sensitivity part of curriculum'

With more reports of crimes against women, a group of schools from across the country are preparing a draft proposal to include 'Education on Social Sensitivity' in the school curriculum from kindergarten to Class 12. The schools will submit the proposal to the human resources and development (HRD) ministry, various state governments and education boards across the country.

The new subject will teach students to be sensitive towards and respect women, senior citizens, weaker sections of society and the environment. The draft will contain the best practices to teach social sensitivity to students through various activities incorporated in the school curriculum, and will recommend making the subject mandatory for all students.

"Generally, such subjects are introduced only in secondary section, but a lot of students drop out after primary school, and so they never get the chance to learn about it,". "Toddlers can be taught compassion through activities that encourage them to look after a plant or a pet animal. Older students can be asked to adopt a neighborhood or a road, giving them the responsibility to keep it clean,

CENTRALIZED AND DECENTRALIZED CURRICULUM

There are some issues related to curriculum development, among of them are aboutthe centralized and decentralized curriculum. This issue is often out of the hands of individuals involved in course development but has impact on all aspects of curriculum development. In Centralization and Decentralization in Education: National Policies and Practices (UNESCO, 2005), it is explained that in theprinciple, centralization and decentralization apply to all essential educationsector functions including planning and plan implementation monitoring,budget and financial management, personnelmanagement, academicmanagement, and provision of infrastructure including procurement.

Planning and Plan Implementation and monitoring in all countries, central government retains the Function of national policy setting and in most countries for national planning, including long-term andmedium-term planning. Annual action plans sometimes referred to as annualplanning and linked to annual budgeting which is undertaken at sub national level.

In some countries, strategic planning functions are also the responsibility of regional or provincial entities. F education levels considered strategic, such assecondary education in many countries, school mapping rema a centralizedfunction while responsibilities have been devolved to lower tiers of government for primary education.

As decentralization proceeds, increasinglyinformation come from certain monitoring and evaluation systems grow ineducation sectors all over the world sometimes reversing some of the potentialbenefits of decentralization through increased bureaucratization and control.

Nowadays, two types of organizational structure can be seen, which are centralized and decentralized.

Centralization of authority means the power of planning and decision making are exclusively in the hands of top management while in case of**Decentralization**, the powers for the same has been disseminated by the top management to middle or low level management. There is a never ending debate between these two terms to prove which one is better

BASIS FOR COMPARISON	CENTRALIZATION	DECENTRALIZATION
Meaning	The retention of powers and authority with respect to planning and decisions, with the top management, is known as Centralization.	The dissemination of authority, responsibility and accountability to the various management levels, is known as Decentralization.
Communication Flow	Vertical	Open and Free
Decision Making	Slow	Comparatively faster
Advantage	Proper coordination and Leadership	Sharing of burden and responsibility
Power of decision making	Lies with the top management.	Multiple persons have the power of decision making.
Reasons	Inadequate control over the	Considerable control over the

BASIS FOR COMPARISON	CENTRALIZATION	DECENTRALIZATION
	organization	organization
Best suited for	Small sized organization	Large sized organization

The following are the major differences between centralization and decentralization:

1	The unification of powers and authorities, in the hands of high level management is known as Centralizatio	Decentralization means dispersal of powers and authorities by the top level to the functional level management.
2	Centralization is best for a small sized organization,	but large sized organization should practice decentralization.
3	In centralization formal communication flow is here.	Conversely, in decentralization, communication stretches in all directions.
4	In centralization due to concentration of powers in the hands of a single person, the decision takes time.	On the other hand, decentralization proves better in terms of decision making as the decisions are taken much closer to the actions.
5	There is full leadership and coordination in Centralization	Decentralization, shares the burden of the top level managers.
6	The reason for centralization is inadequate control over the organization	but the reason for decentralization is good and effective control over the same.

Competency of teachers

Five Competencies for Culturally Competent Teaching and Learning

Today's classrooms require that instructors possess competencies for teaching all students. Robust instructional strategies and culturally sensitive curricula are critical, but more important is an instructor who is sensitive and responsive to the unique differences of each student. Recognizing the need to

strengthen specific competencies to reach and teach all students requires an understanding of new and a willingness to view instruction through varied cultural lenses.

1. Culturally competent teaching and learning facilitates critical reflection. A critical analysis of one's own cultural assumptions is foundational to culturally-responsive teaching and learning. Critical reflection on tightly held cultural assumptions is necessary to dislodge misconceptions and stereotypes. Culturally-responsive teaching engages students in self-awareness activities that lead to reflection on cultural assumptions. For example, in situations where beliefs about learning vary diametrically, there may be serious misunderstandings. When one student believes his learning is unrelated to timely arrival to class and another student views punctuality as a sign of respect, or when one student asks many questions and another quietly wrestles with issues in the content, each may struggle with respect or acceptance of the others. While all may be learning, each may view the others as lazy, disruptive, or disrespectful. Diverse instructional groupings allow students to learn about individual differences and to reflect on their own assumptions and beliefs.

2. Culturally competent teaching and learning demands respect for others. Every student possesses a unique cultural background. Experiences based on various traditions, norms, and values inform ways of knowing and learning. Learning communities with many ways of knowing and learning benefit everyone. When there is little diversity, the overwhelming presence of "whiteness" may be intimidating to students of color and English Language Learners (ELLS) and may serve to silence their voices. Culturally responsive methods such as inter-cultural communication stimulate respect for the needs of all learners and allow every voice to be heard.

3. Culturally competent teaching and learning involves accommodating individual learners. Respect for the learner is a critical component of effective teaching. In addition to pedagogical and subject matter knowledge, competent instructors relate well to their students and possess dispositions such as compassion, fairness, integrity and respect for diversity. Teaching that is respectful and learner focused will naturally involve individual accommodations. Good teachers not only learn from, but learn about their students. Learning about the cultures and languages of individual students provides a foundation for implementing effective accommodations that facilitate learning. Learning about students involves listening to them, interacting with them, and modeling for them. Effective accommodations for diverse students may include extra time on exams to accomm odate the additional load on mental processing, exams in another room where students are able to write, read aloud, then revise their answers to test questions, or time to verbally elaborate on their written responses with the instructor.

4. Culturally competent teaching and learning requires the use of intercultural communication skills.Culturally competent instructors are willing to learn from their students; they recognize the potential

of intercultural communication as a means for enhancing the learning of the entire learning community. Effective communication with others who are linguistically and culturally different includes the use of techniques like active listening, elaboration, paraphrasing, and restatement. Active listening is a process where both the sender and receiver are fully engaged, the listener is focused and attentive, and distractions are minimized. Active listening strategies are especially important when participants speak different languages. Intercultural communication strategies such as active listening inform learning and facilitate critical reflection.

5. Culturally competent teaching and learning requires focused activities and intentionally structured environments. Perspective-taking behavior requires an understanding of norms, values, and traditions that have informed the other's worldview and learning behaviors. Ranking the value of ideas such as tradition, religion, independence, education, work, health, respect, honesty, food, etc. and a review of personal rankings with other class members may lead to meaningful conversations. Such activities may encourage students to engage in critical reflection on deeply held assumptions related to values and beliefs. Intentional groupings of students with others from different racial groups have been shown to have a positive impact on students—especially white students

Diversity Competencies for Teacher Education Candidate: Teacher Education Candidates are required to demonstrate diversity competencies that demonstrate awareness, understanding, and appreciation for the differences among groups of people and individuals based on ethnicity, race, socioeconomic status, gender, exceptionalities, language, religion, sexual orientation and geographical area. These basic competencies must be successfully demonstrated within a series of required professional education, elementary and secondary courses previous to student teaching. In addition, candidates are also required to demonstrate pedagogical skills that support diverse student learners in P-12 schools. These skills are demonstrated on evaluations in field experience courses and ultimately during student teaching. Once awareness, understanding, knowledge and skills are demonstrated, the advisor or designee will verify that the competencies have been met. Circle all courses the student has taken.

The Problem of Curriculum Load

1. Preamble

A Committee was concerned with one major flaw of our system of education. This flaw can be identified briefly by saying that "a lot is taught, but little is learnt or understood". The problem manifests itself in a variety of ways. The most common and striking manifestation is the size of the school bag that children can be seen carrying from home to school and back to home everyday.

A survey conducted in Delhi revealed that the weight of school bag, on an average, in primary classes in public schools is more than 4 kg while it is around 1 kg in MCD schools. Nevertheless the load we want to discuss is not only the physical load but the load of learning which is there for all children irrespective of the category or type of schools where they study. The situation has become worse over these yeas, with even pre-school children carrying a bag of books and notebooks. And the sight is not confined to metropolitan cities alone it can be seen in small towns and the bigger villages too.

The weight of the school bag represents one dimension of the problem; another dimension can be seen in the child's daily routine. Right from early childhood, many children especially those belonging to middle classes, are made to slog through home work, tuitions and coaching classes of different kinds. Leisure has become a highly scarce commodity in the child's, especially the urban child's life. The child's innate nature and capacities have no opportunity to find expression in a daily routine which permits no time to play, to enjoy simple pleasures, and to explore the world.

2. Joyless Learning

It is hard to reconcile the rigorous 'academic' regime that is imposed on children from an early age with the widespread complaint made about the declining norms and performance of the formal system of education. Teachers routinely complain that they do not have enough time to explain anything in detail, or to organise activities in the classroom. 'Covering' the syllabus seems to have become an end in itself, unrelated to the philosophical and social aims of education. The manner in which the syllabus is 'covered' in the average classroom is by means of reading the prescribed textbook aloud, with occasional noting of salient points on the blackboard.

Opportunities for children to carry out experiments,excursions, or any kind of observations are scarce even in the best of schools. In the average schools especially the school located in a rural area, even routine teaching of the kind described above does not take place in many cases. In several states, school teachers encourage children to attend after-school tuition given for a fee while regular classroom teaching has become a tenuous ritual.

One message of this situation is that both the teacher and the child have lost the sense of joy in being involved in an educational process. Teaching and learning have both become a chore for a great number-of teachers and children. Barring those studying in reputed or exceptional institutions, the majority of our school-going children are made to view learning at school as a boring, even unpleasant and bitter experience. They are daily socialised to look upon education as mainly a process of preparing for examinations. No other motivation seems to have any legitimacy.

The contribution that teachers make towards this kind of socialisation is especially worrisome. Trained teachers are expected to be aware of the wider aims of education; indeed, aims like development of the "child's total personality" are the shibboleths of teacher training institutions everywhere in the country. It appears that teachers feel they can do little to pursue such lofty aims in any realistic sense under the harsh circumstances created by factors like excessively large classes, a heavy syllabus, difficult textbooks, and so on. Moreover, majority of them neither know nor have the necessary skills to realise the goals of education. The recommended pupil- teacher ratio of forty to one is now more an exception than a norm, and in many parts of the country it is customary to have sixty to eighty students in one class. The Committee learnt that in many states senior secondary classes often have one hundred or more students, many of them spilling into the corridor. In the national capital, many 'model' secondary schools, Central Schools, and several elite public' schools have classes, including primary classes, with more than sixty students.

This kind of class-size understandably generates a feeling of helplessness among teachers, but why must teachers feel helpless in the face of curriculum-related problems such as heavy syllabi, poorly produced textbooks, etc.? Why don't they act in more vocal ways and involve themselves in curriculum reform? Apart from the fact that there are very few forums encouraging curriculum inquiry and reform in any systematic manner, it seems to be an entrenched attitude among teachers to regard all decisions about curriculum and textbooks as the responsibility of 'authorities'. The fact is that while the teachers' involvement in the preparation of syllabi and textbooks is verbalised as a matter of principle, in practice it takes the shape of token involvement of a handful of teachers. Most teachers havereason.

Therefore, to think that they have little to say about the changes made from time to time in syllabi and textbooks. Even in such extreme cases where a textbook has a factual mistake, no complaints are made by teachers asking for correction of error. There is no established procedure or official forum to mobilise teacher vigilance and participation in curriculum improvement. On the contrary, there are cases where an individual teacher who complained about an error in a State-published textbook, was taken to task. Even if such cases can be described as rare or exceptionally unfortunate, they explain why the majority of teachers intuitively feel that it is not their business to critically examine the syllabus and texts they teach.

3. Examination System

Much has been written by various official committees on the ills of our examination system. The major, well-understood defect of the examination system is that it focuses on children's ability to

reproduce information to the exclusion of the ability to apply concepts and information on unfamiliar new problems, or simply to think.

The public examinations taken after Classes X and XII have assumed the importance of major events which have a set character or culture of their own. The awe they generate, the responses they trigger, and the kind of preparation they demand have all got so entrenched into the social lore that minor improvements in the style of question papers do not make difference to the dominant influence that the examination system has on the processes of learning and teaching. The influence is so strong that schools start holding a formal written examination several years prior to Class X indeed, in the primary classes in many parts of the country, And children receive the message almost as soon as they start attending school that the only thing which matters here is one's performance in the examination.

Both the teacher and the parents constantly reinforce the fear of examination and the need to prepare for it in the only manner that seems practical, namely, by memorising a whole lot of information from the textbooks and guidebooks. Educated parents, who have themselves gone through examinations, and the uneducated parents, whose knowledge of the examination system is based on social lore, share the belief that what really matters in education is the score one gets in the final examination. This belief is undoubtedly rooted in social or market reality. Percentage of marks obtained in the high school, higher secondary, or BA/B.Sc examinations is what ultimately matters in determining a student's chance of being called for an interview for admission to a university or for employment. Since the examination store is what a candidate carries with him or her as the key authoritative record of school or college performance, higher level institutions or employing agenciesunderstandable rely on it. It is a process in which no beginning or end can be meaningfully established. Changing the system of examination in a structural or even in a merely procedural sense does not require that a source outcome or cause-effect relationship be established; yet, the examination system goes on, apparently with the help of energies or rationales located in the system of education itself.

4. Textbook as the 'Truth'

The pervasive effects of the examination system can be seen in the style and content of textbooks and not just guidebooks which are specifically manufactured to help children pass an examination. If 'facts' or 'information' constitute the main burden of an examination, the same is true of textbooks. Barring exceptions, our textbooks appear to have been written primarily to convey information or 'facts', rather than to make children think and explore, Over the years some attempts have been made to incorporate a certain amount of reflective writing in textbooks. Such writing is so exceptional that its examples can be spotted and named without difficulty. 'How leaves are designed' in a Class VIII textbook is one such piece

of writing. It stands out from among the thousands of pages of textbooks in different subjects that our teachers and children have to go through painstakingly so that they can retain the information recorded in those pages in a highly compressed, usually abstruse manner. The more common style used in the textbooks is exemplified by passages of the following kind:

The term pH is defined as the negative logarithm to the base 10 of the hydrogen ion concentration expressed in gram ions per litre or moles per litre. (Class X)Fatty acids are slowly hydrolysed during digestion in the small intestine to form glycero and fatty acids through the enzyme action of lipase which is secreted by the pancreas, (Class X)

We find that while dividing a decimal by a multiple of 10,000 or 1,000, we first move the decimal point to the left as many places as there are zeros in the number and then divide the resulting decimal by the second factor of the divisor. (Class V)

The problem of readability in textbooks becomes grim in the context of a system which often leaves the child with no resource other than the prescribed textbook. The extent to which the child can rely on a teacher to elucidate tersely written text material is dependent on the quality of teachers, their training, and their accountability. From what impression the Committee could form about these aspects of the system, it seems valid to say that the child is very often helpless in the face of a style of teaching that is far from being interactive, let alone the absence or irregular presence of teachers. Under the circumstances that are widely prevalent in our country, a child is more likely than not to mug up the definition of 'pH'quoted above without grasping it. And mugging does get the child through the examination!

Textbooks and guidebooks form a tight nexus. In some parts of the country children are compelled to buy the guidebook (or 'key') along with the textbook. The economic and business aspects of this pairing apart, the academic function of the textbook has become quite dubious indeed. It is not perceived as one of the resources for learning about a subject, but as the only authoritative resource. This kind of sanctity distorts what useful purpose the textbook could serve Teachers see it as a body of 'truths' which children must learn by heart. This perception and urge to 'cover' the chapters of the prescribed textbook. turn all knowledge into a load to be borne by the child's memory.

The distance between the child's everyday life and the content of the textbook further accentuates the transformation of knowledge into a load. We are not talking here about advanced science or mathematics, but about elementary science, social studies, language and arithmetic. Textbooks treat these subjects in a manner that leads to alienation of knowledge from the child's world. This tragic phenomenon

takes different forms in different subjects in natural sciences, it takes the form of esotericisation of t subject, In the social sciences it becomes manifest in the coating of every inquiry in didacticism. suggestive of one preferred answer to every question. A common source of alienation of subject-matter from the children's perspective and life is the presentation of the life-style and world view of the urban well-off class. This life-style is characterized by access to concrete housing, modern kitchens, electrical gadgets, and so on. Of course there is nothing 'wrong' with this life-style; but the symbolisation of this life-style in every illustration and description that concerns a child's home life alienates millions of children who live in houses with traditional kitchens, or with no separate kitchens. Objects of daily use in common Indian homes, such as a broom or clay pitcher, are seldom seen in textbooks.

6. Observation Discouraged

A highly disturbing tendency we discovered in text writing, which exacerbates the problem we are discussing, is that of treating pictures as substitutes for experience. We found textbooks asking children to observe a picture of the object under study rather than asking children and the teacher to go out and observe the object itself in nature. For example, a Class V science text says : 'Look at the picture of a cactus plant. Observe the thick green structure..... Such an instruction preempts what motivation there may be in a teacher or child to bring an actual cactus plant to the class or to grow one.

The most painful example of this phenomenon brought to our attention was one in which a private publisher claimed that he had made the teacher's task 'easier' by turning an official 'Teacher's Guide', which suggests that the teacher should take children outside the school and identify some common birds, into a text where the pictures of all the common birds with with their names were provided for ready use. This case is especially painful as it shows how even a specific instruction given in a Teacher's Guide (Teacher's Guides are themselves rare; and in subjects in which they have been prepared in certain states, circulation has not been satisfactorily looked after) to encourage teachers to extend the lesson beyond the four walls of the classroom is co-opted within the dominant, traditional approach of teaching everything verbally from a textbook.

Over the recent years, some textbooks have adopted the vocabulary of observation and exploration or discovery as a necessary part of science teaching, but even here, virtually all commands for observation conclude with statements about what will be seen if an observation is actually made, thereby making it unnecessary for the teacher and children to find an object and actually observe it.

7. Structure of Syllabus

The absence of the child's viewpoint is also reflected in the organisation of syllabi in different subjects. We received a large number of complaints from parents as well as teachers that the content of syllabi lacks an overall organisation or coherence. Gaps in the syllabi between the lower and the Higher Secondary stages are as common as repetitions of the same content. These weaknesses of organisation apparently lead to memorisation and poor comprehension;both exacerbate the sense of curriculum load. Gaps between the secondary and the senior secondary stages seem to be glaring in the science syllabi. When students come to Class XI, they often find themselves without a clue even if theyhave done well in Class X. The level of abstraction attempted in the senior secondary stage science syllabi and textbooks, especially the physics textbooks, represents a jump in many topics. Apparently, those preparing the senior secondary syllabi and texts lacked adequate familiarity with the syllabi and text used in the earlier classes. In fact, they had no occasion to interact with the persons involved in the preparation of syllabi and textbooks for secondary classes (X and X).

Repetitions of concepts and information also leads to boredom and a sense of load. The need to repeat is rooted in the flawed structure of syllabi. In the primary classes, ideas and information are presented in a synoptic manner, making the text look deceptively simple. In the later classes, the same ideas are repeated, with some elaboration which does not prevent the child from viewing the ideas as trivialised by repetition. In the study of nutrition and health, for example, virtually the same ideas and information are given in the syllabi and texts of Classes III, IV, V, VII and X. Even the questions given at the end of the lessons in the texts are almost of the same kind. Apparently, the structure of syllabi is not carefully thought out. Indeed, our Committee was told by senior experts, who have been involved in syllabus and textbook preparation, that experts working on the syllabus of different levels (secondary and senior secondary) had no contact with each other. Reference to such procedural lapses, however, is not necessary to explain the tendency towards repetition that is embedded in the structure of the syllabus and has been reinforced by tradition.

8. Teaching Everything

The problem of densely packed syllabi like this one cuts across disciplines. In geography, it takes the form of all the continents being 'covered' under regional geography between Classes VI and VIII. In mathematics and the natural sciences, the packing of details makes any kind of learning with understanding, leave alone enjoyment, virtually impossible Numerous examples could be given from these disciplines to illustrate the problem. We are not citing this example as a specific case to be looked into, but as evidence of a deeply rooted tendency, rather all ideology, which impels syllabus and textbook planners to include 'everything' without ally regard for children's ability at different ages to learn and the time available in an average school for teaching a subject. Class XI and XII textbooks of science,

prepared recently with a view apparently to implement the National Education Policy, have been wi criticized on these scores.

Children studying science subjects have been asked by their teachers to look for private tutors, the rationale being that there may not be enough time in the class to cover the syllabus, and some of the syllabus being beyond the capacities of the teacher. The terse content of these texts was apparently edited and reviewed in some haste; we were informed, due to constraints of time while sending the manuscripts for publication. Perhaps it can be argued that these textbooks are liked by the highly motivated and the brightest among the students and teachers. If this indeed in the case, it gives all the more reason to worry about the fate of the overwhelming majority of children studying in ordinary schools.

9. Starting Early

The general problems of curriculum conceptualisation that we have discussed in this part of our report can all be seen reflected in the emerging pre-school sector of the education system. Despite official stipulations that no textbooks be used at this stage, preschool teachers and parents in the urban centre are feeling 'compelled' to burden theyoung child with textbooks and the formal learning they represent. The sense of compulsion comes from a widespread feeling that unless academic training of a child starts early, he or she cannot cope with the fast-paced pedagogy and the competitive ethos of the later school years.

The pernicious grip of this false argument manifests itself in absurd, and of course deeply harmful, practices in pre-schools and primary schools, such as early emphasis on shapely drawing, writing, and memorising information. Intrinsic motivation and the child's natural abilities are being smothered at a scale so vast that it cannot be correctly estimated. Our national commitment to the development of human resource is daily challenged in our nurseries and primary schools.

10. Not Just an Urban Problem

The problem we have tried to identify in this part of the report is not confined to urban areas as some people think. It is deeply relevant to children's education in rural India although their, more basic problems - such as abysmally pure condition of schools, absenteeism among teachers etc. may cloud the problem curriculum load. In our view, the problem of high drop-out rate, which has rightly pre- occupied our policy-makers for a long time, has one of its origins in the curriculum scenario we have portrayed.

A curriculum policy that takes away the elements of joy and inquiry from learning obviously contributes to the rate at which children leave school in early years, undoubtedly under the force of economic and social circumstances. As we have indicated earlier, symbolic tilt towards an urban, middle

class way of life in text books can also be expected to make the rural Child's association with his or her experience at school thin and brittle. Quality of teachers and the equipment available to them also make an impact on the tenuous and fragile links that the first- generation learner in many parts of rural India tries to establish with the system of education.

Participants in Curriculum Planning

Teachers

Holistic planning requires substantive teacher involvement in curriculum development, at both the district-wide and building levels. For example, teachers in Shaker Heights analyze students' needs, conduct research, discuss parent input, write or revise courses of study, field test the curriculum, monitor student progress, and evaluate student outcomes.

Moreover, teacher representatives on the K-12 subject-area committees are responsible for informing their colleagues about the work of the committees on which they serve and for reporting their colleagues' reactions back to the committees. Staff development programs also help to keep faculty members apprised of curriculum activities and newly adopted resources.

Teachers who participate in planning are more likely to accept change and to put the new curriculum into practice. Also, as Haberman notes, more teacher participation in curriculum planning results in "improved teacher self-concept, their greater sense of responsibility and commitment to the school and the curriculum, and increased student motivation. By the very nature of their responsibilities, teachers must be an integral part of the planning process.

In fact, Tyler (1987) states that the teacher is the most significant factor in implementing school reform. Consequently, every effort must be made to ensure not only that teachers have a thorough understanding of curriculum theory and practice, but also that they possess the requisite skills for competently planning instruction and for making sound decisions about aligning the curriculum with students' wide ranging differences.

Unit teaching is an excellent way for the teacher to translate the curriculum into classroom practice and to accommodate students' individual differences. The teaching unit, with its broad array of objectives, content items, activities, materials, and evaluation devices organized around a topic, provides not only for student differences but for student-teacher planning and subject integration as well. A unit might include activities such as computer-based learning, cooperative learning, peer tutoring, and study projects.

McIntosh and Vaughn (1992) discuss how a unit resource notebook can serve as an organiz technique. The unit resource notebook, in the form of a large, three-ring binder, might hold such components as teaching ideas, visual aids, reading/study guides, and bulletin board sketches.

Community Members

Holistic planning is further characterized by the participation of lay citizens, who attend district-wide curriculum planning committee meetings and serve on school-based planning committees. Lay citizens are appropriately involved with school professionals in identifying, thinking about, and discussing curriculum program issues and problems. For instance, lay citizens could be involved in debating whether or not to implement a sex education program. If the program is ultimately adopted, the lay participants might then provide input concerning such matters as the sex education program's general purposes, priorities, and procedures. School professionals remain in charge of diagnosing students' learning difficulties and needs and making decisions about incorporating instructional objectives, content items, activities, materials, and evaluation devices into actual teaching-learning situations.

School Leaders

Holistic planning requires competent planning leadership along with full and meaningful teacher involvement. The school principal often has responsibility for both administrative and curriculum matters. Consequently, the principal's training must include not only courses and field work in administration but also a substantial concentration in curriculum theory and planning and a supervised curriculum field experience. Pajak and McAfee (1992) point out that principals, to be successful curriculum leaders, not only need to understand curriculum organization and the place of instructional activities, materials, and learning outcomes in the curriculum, but also must be able to formulate strategies, coordinate curriculum activities, and monitor the program.

The principal's curriculum concentration, by emphasizing the group process and providing knowledge of planning principles, strategies, materials, and assessment procedures, enhances his or her ability to effectively function as a planning leader. Ornstein and Hunkins (1988) suggest various guidelines regarding the principal's role in curriculum change, including the need for the principal to have good human relations skills as well as a thorough understanding of the staff, school system, and community.

ROLE OF TEACHERS' IN CURRICULUM DEVELOPMENT

Teacher Education provides a platform to student-teachers to acquire the required knowledge, skill and develop positive attitude, values and beliefs. This can be done with the help of the provided curriculum. And the quality of teacher produced in any institution invariably depends on the curriculum

offered to them during their training period. After reviewing various researches on the curriculum and significant role of teachers' in framing the curriculum the process of curriculum development was decentralized. The process of curriculum framing and preparation of textbooks be decentralized so as to increase teachers' involvement in these tasks. Decentralization should mean greater autonomy within the state/district.

As curriculum is the best mean of overall development of students. And teacher is mediator between curriculum and students. She/he knows various needs of students, educational institutions, industries, parents (stakeholders). The quality of teacher education is maintained by curriculum of Teacher Education. The curriculum development is dynamic process.

THE ROLE OF GOVERNMENT OF INDIA IN EDUCATION

The role of curriculum in national development

Education is a vital investment for human and economic development and is influenced by the environment within which it exists. Changes in technology, labour market patterns and general global environment, all require policy responses. Traditions, culture and faith all reflect upon the education system and at the same time are also affected by them. The element of continuity and change remains perpetual and it is up to the society to determine its pace and direction.

We are living in an inquiring and innovation-oriented society. The demand of twenty first century is novelty, creativity, and integration of knowledge at global level, research, critical and analytical thoughts. Rapidly social changes are creating uncertainty and complexity in the society. To prepare the children and youth to cope with the present situation needs to develop analytical and critical thinking, skill and attitude that would make them more flexible and innovative to deal with uncertainty and crises at national and global level.

The greatest need of the hour is to re design curriculum, textbooks, teaching methodology and children's literature, formal and non-formal educational systems. It has been demonstrated by researcher that active learning (questioning and investigate the nature of topic) develop creativity and stimulate for learning.

Teacher As Curriculum Maker

1. **The Teacher Framed by the Conduit Metaphor**

In an attempt to summarize and understand this metaphor I found some information on the Encyclopedia Britannica Online that supplemented that of the chapter. The Conduit Metaphor refers to the

idea that knowledge is a "commodity that is external to learner", meaning that it is provided for them rather than something that they construct themselves. In practice it refers to the idea that the student is empty vessel waiting for the teacher to fill them with their infinite knowledge.

Success can be measured by the student's ability to regurgitate that knowledge with a high percentage of accuracy. It is the job of the student to memorize the information provided for them without consideration for their own context or experience. The teacher is expected to provide a scripted wealth of information through prescribed methods. These methods and content were provided for them through the curriculum.

This is what I believed teaching to be when I began my career. As I began teaching, I quickly became bored and unsatisfied with this method and deviated from it. In doing so, I abandoned the curriculum except for obtaining the grade appropriate "topics" that I could address with my class in a way that I thought they would find the most engaging. The chapter refers to this abandonment when it refers to a study of the Toronto secondary school biology curriculum conducted in 1978 in which it was found that

"Roughly two-thirds of the curriculum taught was outside the bounds of policy specified in the provincial guidelines document and was therefore technically illegal."

While it was assumed that teachers were and should be using prescribed curriculum and were acting in accordance to the "conduit metaphor", it was not happening. Teachers were instead being "curriculum makers"

2. "Teacher-Proof" Curriculum Within The Conduit: From Teaching Machines to Distance Education

I think that you would agree with me when I say that I am very glad that those machines did not become common place as they are the epitome of the teacher as conduit model!

This section of the chapter also discusses another method of computer assisted learning that they refer to as Computer Assisted Learning environments. In this case, computers are used to facilitate student learning but that the role of the educator in this model is unclear. They go on to introduce the Computer Mediated Communication System. This is described as

"Helping distance educator develop their own kinds of interactive classrooms: small and large, local and regional group configurations of learners are created by a telephone, computer conferencing and face-to-face meetings and workshops."

The authors write that this type of computer assisted learning is one in which the teacher must take on the role as curriculum maker as they must work collaboratively with the learner to create this space and what they will be learning within it

3. The Humanities Curriculum Project

The chapter goes on to say that just like Structural Innovation, some school had success, some did not. One of the key aspects talked about earlier in the chapter was that change only works if the teachers are involved in the decisions. In the case of the Humanities Curriculum Project, it was intended for the teacher to be central to the reform in the classroom but how that would look was shaped by the researcher and not by the teacher. As mentioned previously in the chapter, that would not work.

I know that in our application to become a Structural Innovation school, all of the teachers had full input however, I did hear of other schools where all decisions and ideas came solely from the administration. I believe that we will have a similar results in our school system as the Humanities Curriculum Project because of this reason. So, yes, in some cases it will not work. That does not mean that we give up trying. There are some success with change. I can speak to this from my experience in my Professional Learning Community and how we have structured our senior classroom. For a peak at what we do, visit our Wiki.

4. Teacher as Curriculum Maker

The authors of this chapter call attention to the need for educational reform. Through examples, they show that the reform will only truly be successful and sustained when the teachers are directly involved in the decisions that are made for change. How do we engage teachers in these decisions? The authors state that teachers must become curriculum makers (and in this, they do not mean only what will be learned but that curriculum should be a "course of life" encompassing all things related to teaching and learning) and that in order for teachers to become curriculum makers, researchers must listen to their stories.

Through this listening, a usable, realistic, engaging format for educational reform can be formulated. I agree with this idea wholly as I have seen and heard the difference that it is making in the success of Structural Innovation in the schools in my system. And while I can not speak for other schools and other teachers, in my school, where the needs, wants, and success stories of the teachers were considered in making our plans for innovation, we have seen many successes.

21st centuary

The students today are experiencing a world which changes more quickly than ever before. They live a faster and more connected life which not only provides them with numerous opportunities to learn but also expects a better performance from them compared to conventional educational methodologies

- What most of the educators believe is that the educational reforms must be done from the earliest stage like curriculum design.

- Abdul Kalam, an eminent scientist and Missile Man of India once shared his conversation with a great lady who came from Finland to share the practices that helped their country to be placed at the top position in Innovation Index 2007.
- When she was asked the question "How do you make your country the No. 1 nation in Innovation Index?", her reply was as follows.
- "Education, Education, Right type of Education and Women Education".
- Here, the term "Right type of Education" refers to creative education. According to Abdul Kalam, the first thing a nation needs to become innovative is creative education.
- **"Imagination leads to creativity, Creativity blossoms thinking, Thinking provides knowledge, Knowledge results innovation and Innovation makes the nation great." – Abdul Kalam.**
- Creative education is the most advanced methodology in which classrooms, teachers and syllabus are imaginative. Creativity in an education system either in primary or in secondary education can surely be achieved by a creative curriculum. Especially, the 21st century education system requires a creative curriculum in order to make students more innovative as it's surrounded by enough tech resources. Let's learn about how most of the educators expect 21st century's curriculum to look like.
- **21st century curriculum:**
- 21st century educational system has many educational technologies that make students more creative than ever before.
- **For Primary Education:**
- "In today's education, the biggest reform needed is in primary education. At the age of 15, the children are very creative and to make them more creative, we need a classroom as well as the syllabus to be creative besides having a creative educator."
- **For Higher Education:**
- In India, especially higher education organizations such as IITs, NITs and State Universities must follow the following aspects in their curriculum:
- Research and Enquiry
- Creativity and Innovation
- Use of technology
- Entrepreneurial leadership
- Moral leadership
- Research oriented Curriculum:

Studies show that most of the students in India who are interested in research prefer to go abroad. Not only India, but also many other countries which can't provide a better research environment will undergo brain drain. What Abdul Kalam has suggested to all such organizations that offer under graduate courses is to make a part of their curriculum research oriented.

- **"The higher the research, the higher the teaching capacity moves."**
- The time has come for us to include research in our curriculum. Instead of fighting against a huge syllabus, we must give priority to the research environment.
- **"The reform has to come from the evolution of new type of curriculum, teaching and classrooms".**
- **Curriculum that involves multi-departmental work:**
- What most of the organizations focus on is that they have a syllabus to be completed within a particular time period so that their students get good marks. 21st century education system tries not only to improve grades of a student but also to make him an independent learner. It should also help students to become multi-talentedto withstand the current competitive world. So, the 21st century curriculum should include multi departmental work. For example, if we take a 4 year under graduate course, a part of the time period such as 8-9 months should be given a room for multi departmental work. When a student from Mechanical Engineering departmentworks with Electrical and Computer Science students, he learns some basics to innovate something like an "Intelligent Line Sensor Robot". This multi departmental knowledge helps the student give better performance in his field.

- **Views of Educators about Creative Curriculum:**
- **Basic Approach:**
- An approach from **Dr. Justin Tarte** & **Gerald Aungst** regarding the curriculum:
- An educator should consider the following questions in order to design an effective curriculum: what to keep, what to subtract, what to add, what to subtract (again).
- **Curricular Goals:**
- The following are the curricular goals of 21st century education system:
- **Imagination:**
- Curriculum must give preference to imagination as I've already included the quote, "Imagination leads to Creativity".
- **Problem solving nature:**
- Curriculum must improve students' problem solving nature as it is a necessary skill every student should have.
- **Critical thinking:**

- Critical thinking is a process that leads to skills that can be learned, mastered and used. It's a tool by which one can come about reasoned conclusions based on a reasoned process. If the curriculum includes more practical works and projects, students' critical thinking can easily be improved.
- **Physical Exercises or Sports:**
- Studies show that physical exercises not only keep a student healthy and fit but also play a great role in improving one's brain functionality. There is no doubt that if curriculum gives importance to Physical education and sports besides education, students will automatically develop both of their co-curricular as well as extra-curricular skills.
- In addition to the above mentioned goals, 21st century curriculum has many other goals that we want to hear from you. Please share your views on how you want 21st century curriculum to be. The comment box awaits you.

CURRICULA DESIGNED TO MEET 21ST-CENTURY EXPECTATIONS

Students' personal experience with technology is typically broad and in many cases very deep. Moreover, their extensive use of technology continues throughout their college experience—that is, except fully integrated into the curriculum.

Implications

- Faculty's understanding of the teaching and learning power of technology needs to be increased.
- Increasing the use of technology will increase demands for technological tools to be effectively integrated into the curriculum to enhance student learning.
- Tools need to be developed to help faculty integrate technology into the curriculum.

21st-Century Expectations

Changes in the larger society over the last 100 years—various social movements, the advent of telecommunications, the movement from industrial-based to knowledge-based work, struggles over political boundaries, modern technology and science breakthroughs employed in both the most positive and most negative of circumstances—have in some form or another impacted the ways colleges and universities "do" higher education. Colleges and universities in the 21st century educate a much larger, more diverse population of students, foster scholarship countless new areas of inquiry, and offer opportunities in many new settings and formats, including online.

Yet many facets of higher education have remained relatively untouched by time, at times to the detriment of our functioning in this new era. To better meet individual and societal needs of the 21st century, numerous leaders—inside and outside higher education—recognized at the end of the 20th century that college and university missions and practices needed to be reinvigorated. Within such a

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process, perhaps consensus could be reached about the new expectations we needed for students, for curricula, and given its infusion into society, for technology. 46

For Students

Since 2000, the Association of American Colleges and Universities (AAC&U) has engaged colleges and universities across the nation in such a process, through a multiyear, multilayered initiative called Greater Expectations. For the first two years of the initiative, AAC&U senior staff convened a national panel of experts who were charged with identifying the hallmarks of a 21st-century college graduate. With input from a consortium of leadership campuses engaged in innovative practices to realize high achievement levels for their students, the national panel recommended new emphasis be placed on educating students to be purposeful and self-directed in multiple ways—on becoming intentional learners. The report issued from their work, *Greater Expectations: A New Vision for Learning as a Nation Goes to College*, states:

> Becoming such an intentional learner means developing self-awareness about the reason for study, the learning process itself, and how education is used. Intentional learners are integrative thinkers who can see connections in seemingly disparate information and draw on a wide range of knowledge to make decisions. They adapt the skills learned in one situation to new problems encountered in another—in a classroom, the workplace, their communities, and their personal lives. As a result, intentional learners succeed even when instability is the only constant.[1]

In short, students are expected to draw on various knowledge bases, integrate them, conduct increasingly more sophisticated analyses as they progress through college, and use their integrated knowledge to solve complex problems.

For the Curriculum

Low-level technologies such as overhead projectors, televisions, and videocassette recorders have been used for some time to focus college students on specific subject matter. The use of technologies typically included text, equations, graphics, and pictures to enhance learning through models and content-rich stories. Early work in learning technology focused on combining what we knew about visual learning and low-end technologies to create multimedia tools to enhance student learning.

Technology an end unto itself instead of the powerful teaching and learning tool that it can be.

Implications

- Much of the learning technology innovation in higher education has been focused on K–12 teacher preparation and development. More focus needs to be placed on preparing existing faculty for the future Net Generation students who will populate the 21st-century classroom.
- To the extent that colleges and universities involve interested faculty and students in working together to develop tools that truly engage them both, the more fruitful their efforts are likely to be for the larger higher education community.

For Technology

Over the past 20 years, most colleges and universities have moved technology from being a one-time budget expenditure to being a hard budget line to support the purchase, maintenance, and, in many cases, use of technology on campus. Less attention has been given to how to help students achieve the desired learning outcomes through technology. While significant financial resources have been devoted to building the technical infrastructure at colleges and universities, much less has been devoted to ensuring that this investment is used to its maximum.

College and university faculty must effectively tap students' existing familiarity with technology to engage them in constructing an integrated knowledge base and developing habits of the mind that will enable them to become lifelong learners. Technology can then become a tool used in the service of learning rather than an end itself.

Implications

- Institutions need to establish greater expectations for maximizing their investment in technology by exploring and assessing the best use of technology for learning.
- Greater investments may be needed in faculty professional development in the effective use of technology for learning.
- Faculty's effort to infuse technology into the curriculum requires support in developing strategies and in resolving technical difficulties. This means more than the technical help desk. What is needed is assistance for using technology to achieve the teaching and learning outcomes we desire.

Technology and the Curriculum

What is the current role of technology in the college curriculum? To develop intentional learners, the curriculum must go beyond helping students gain knowledge for knowledge's sake to engaging

students in the construction of knowledge for the sake of addressing the challenges faced by a complex, global society.

According to the Greater Expectations National Panel, the curriculum and the cocurriculum should provide numerous paths by which students can achieve broad liberal education outcomes alongside specialized knowledge of one or more disciplines.

If students have achieved these outcomes, they will excel at

- communicating well in diverse settings and groups, using written, oral, and visual means;
- employing both quantitative and qualitative analysis to describe and solve problems; and
- working well in teams, including those of diverse composition, and building consensus.[6]

These outcomes can be achieved through strategies such as writing assignments (expository, creative, and personal writing); required and critiqued oral presentations; and problem-based learning.

Students need mastery in areas that include knowledge of human imagination and expression, global and cross-cultural communities, and modeling the natural world. This mastery can be obtained thorough

- undergraduate research;
- inquiry-based science labs;
- planned and supervised experiences in teamwork, both in class and in off-campus settings;
- interdisciplinary and integrated courses on creativity through the ages;
- drawing on students' diverse experiences to enrich classroom discussion;
- integrating study abroad into courses back on the home campus;
- teaching courses worldwide through videoconferencing; and
- student team-designed lab experiments to answer questions.[7]

Students can be expected to be responsible for active participation as citizens of a diverse democracy, understanding themselves and their multiple identities by engaging in

- service learning;
- debate on proposed solutions to current social problems; and
- personal writing that requires self-reflection on a wide variety of subjects and that situates the self in relation to others.[8]

Use of Technology

In what ways might technology enhance each of these innovations and help students achieve desired learning outcomes? At the most basic level, effectively using computer technology is itself a skill

that we want students to develop. Using computer applications such as Access and Excel makes managing and manipulating data much more efficient.

While it's clear that such applications have great utility in business administration courses such as accounting, these programs are often used for other purposes and in other subjects. These applications can be designed to sort a variety of types of information, such as to sort information obtained from qualitative interviews or to sort by predetermined criteria a number of funding possibilities for a service-learning project.

The mere act of setting up small text databases and linking them to equations for analysis gives students practice in managing knowledge, as well as allowing them to easily transfer text to charts and displaying information in a variety of ways. Knowing how to use all the functions of these and other programs such as PowerPoint enables learners to efficiently edit text and include graphics in the final products they submit to demonstrate their learning. These uses of technology can be applied to undergraduate research and can contribute to students making reasoned linkages among seemingly discreet pieces of information, therefore integrating knowledge for deeper learning.

Multiple Media

By using multimedia, faculty and students can demonstrate an enriched teaching and learning enterprise that goes well beyond more traditional "cubicle-based" computer use.

The use of multimedia enables students to demonstrate learning beyond a specific topic under study. The example above specifically focuses on comparisons of voluntary and involuntary immigration; however, working in teams and using multiple technological forms facilitates the introduction of other topics such as social justice, ethics, and economic systems more easily. Group work where students can match their talents and interests to specific technological tasks enables each student to pursue an aspect of the assignment that appeals to the way she or he learns best.

Add Flexibility

Because we know that different students learn best when they are challenged to learn in different ways, technology allows teachers to add flexibility to how they present new information and provide feedback to students. For example, both skills and content will be enhanced when students are asked to demonstrate their learning through multimedia presentations to the rest of the class. Virtual discussions allow instructors to help the class develop their analytical judgment.

The course assignment cited above can also help students explore the circumstances surrounding each immigrant group's departure from its homeland, the route or routes taken to arrive in the United States, where they arrived, and why. The assignment could take on a deeper dimension by using videoconferencing and e-mail to link teams to students living in the countries of origin of the groups being studied. Integrating real-time global experiences into the classroom can provide a new, first-person information source and engender debate about the validity of various sources of information used in conducting research. These technologies make it easier for courses to depart from chronological, linear formats.

Conclusion

Future careers will require higher levels of education than in the past. That education must enable individuals to discover what they need to know rather than just having static knowledge. Society will need college graduates with mental agility and adaptability.

If this is the goal of education, colleges and universities must reexamine how that goal is achieved. The Net Generation and the current capabilities of information technology make it possible to support learning activities that will enable graduates to be mentally agile and adaptable. However, beyond technical infrastructure, the use of technology in the service of learning is limited.

The *Greater Expectations* report calls for a focus on developing intentional learners; it also calls for developing intentional institutions. Colleges and universities are connecting silos of administrative work with relational databases so that, for example, financial aid structures can interface with human resources and accounting, ensuring students can work for the institution and maintain simultaneous student and staff categorizations. Eight years ago this was not easy, but today no one thinks it should be any other way.

Clearly, technology can facilitate the achievement of the operational goals of the institution. But achieving one of its most important goals—improving the learning of all students—through technology will require conversations at all levels—department, college, institution, and state. With calls for greater accountability for increased spending and for assessment of student learning, we can ask for no less than the effective and coherent integration of technology into an enriched curriculum that meets both student and societal expectations.

• Education throughout life is based on four pillars: learning to know, learning to do, learning to live together and learning to be.

• **Learning to know,** by combining a sufficiently broad general knowledge with the opportunity to work in depth on a small number of subjects. This also means learning to learn, so as to benefit from the opportunities education provides throughout life.

• **Learning to do,** in order to acquire not only an occupational skill but also, more broadly, the competence to deal with many situations and work in teams. It also means learning to do in the context of young peoples' various social and work experiences which may be informal, as a result of the local or national context, or formal, involving courses, alternating study and work.

• **Learning to live together,** by developing an understanding of other people and an appreciation of interdependence - carrying out joint projects and learning to manage conflicts -in a spirit of respect for the values of pluralism, mutual understanding and peace.

• **Learning to be,** so as better to develop one's personality and be able to act with ever greater autonomy, judgement and personal responsibility. In that connection, education must not disregard any aspect of a person's potential: memory, reasoning, aesthetic sense, physical capacities and communication skills.

• Formal education systems tend to emphasize the acquisition of knowledge to the detriment of other types of learning; but it is vital now to conceive education in a more encompassing fashion. Such a vision should inform and guide future educational reforms and policy, in relation both to contents and to methods.

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