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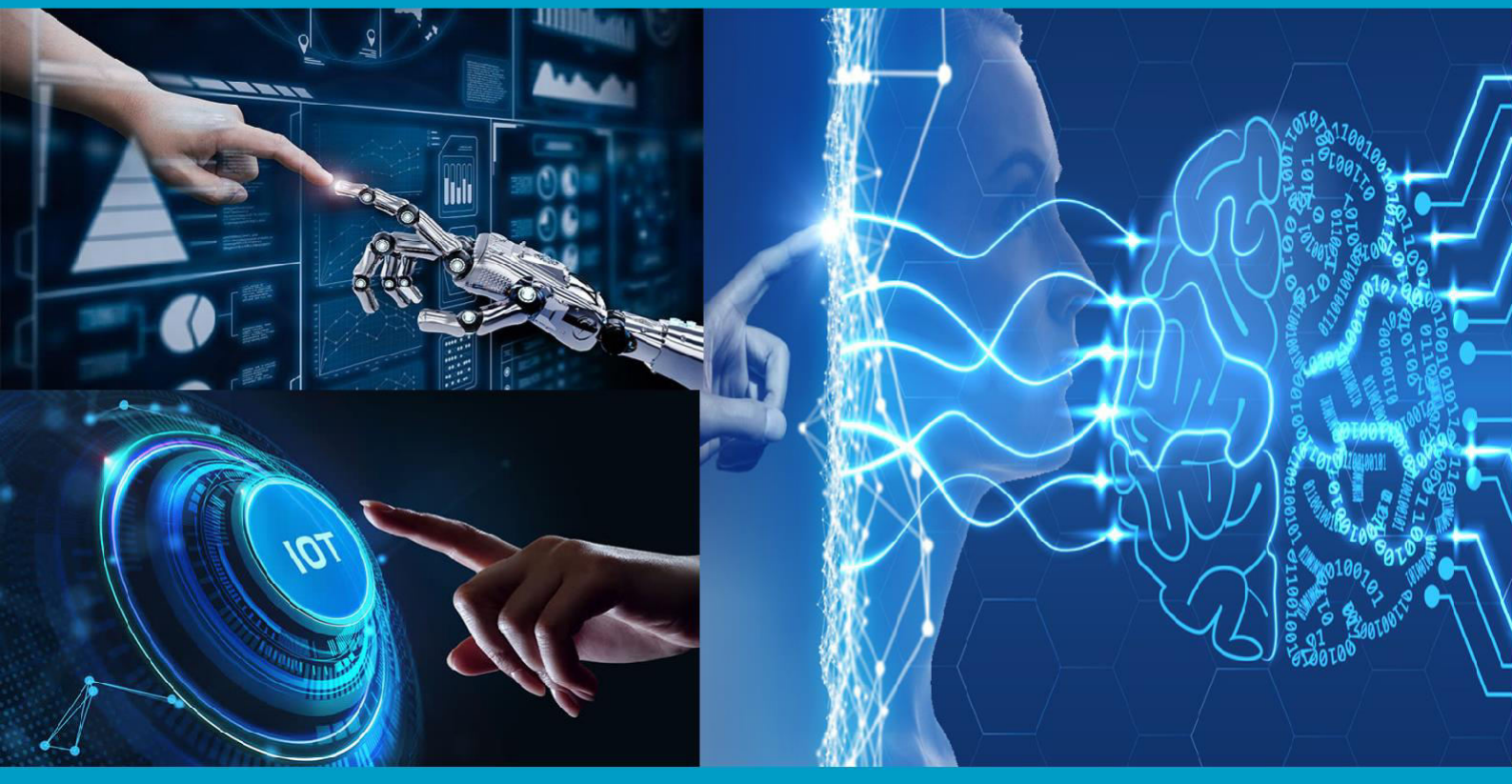

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The Impact of Understanding in Classroom Teaching-Learning Process

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ABSTRACT: The teaching life is the life of the explorer, the creator, constructing the classroom for free exploration. It is about engagement. It takes courage. It is about ruthlessly excising what is flawed, what no longer fits, no matter how difficult it was to achieve. It is about recognizing teaching as a medium that can do some things exquisitely but cannot do everything."Teaching and learning go hand-in-hand. Effective teachers continually improve their skills by learning about the latest trends in the field of education. But what exactly is teaching and learning, and how do you foster a relationship between the two that is synchronistic and fluent? The following guide offers teaching principles, learning examples, and the importance of a healthy relationship between student learning and teaching.

KEYWORDS: teaching, learning, understanding, effective, student, classroom, education, relationship

I. INTRODUCTION

Schools are the second place after home where students' behavior and future educational success are shaped. At schools there are many elements or factors that can influence the teaching and learning process that may take place. Rasyid (2012) stated that there are four perennial truths that make the teaching and learning process possible to take place in the classroom. If one of these is not available, there will be no teaching and learning process, though the learning process itself may still take place, they are: (1) Teacher, (2) Students, (3) Material and (4) Context of time and place.
"Most teachers resist showing students the dirty part of real learning, and by the dirty part I don't mean the hard work…I mean the part where we fail nine times in a row before we find a good approach. I mean the parts where we are confused about our project, defensive in the face of criticism,[1] doubtful of our abilities…Whatever the venue…teachers like modeling their knowledge, not their ignorance, and they avoid referring to the muddy paths, fear-filled moments, and just plain failure that are the unavoidable parts of getting the knowledge we possess."Teaching and learning are multi-faceted phenomena—and that's how we should be thinking about them, right from the start. Books written for beginning teachers, in fact lots of teaching books, focus on techniques. Yes, new (and old) teachers need techniques, but when that's the main focus, it tends to narrow the thinking and trivialize the complexities[2].The literature on teaching and learning is diverse—one of its finest features. It can do a good job of shaping this broader thinking if it's sampled across disciplines, topics, and categories. The following articles and programs are reflective of how those learning to teach (doesn't that include all of us?) ought to begin and proceed.[3]

"Good students are those who learn. Whatever their preconceptions, barriers or deficits—whatever their story—they take new information and new experiences, and to the best of their ability, make them tools for transforming themselves and their world. And at last I've learned that a good teacher is someone who can recognize and connect with good students—in all their forms."[4]

The learning-teaching synergy happens when teachers are thinking, observing, and focusing in all sorts of ways on learning—when we are constantly asking, "What's going to help students learn this?" This focus on learning and attempts to understand how it's happening for students drives decision-making about teaching. It is what determines whether students will work in groups, whether they need to write or speak answers, whether their understanding of a concept should be tested, and on and on. Teachers become learners of learning.[5] We have always been learners of content, but now in every class we seek to better understand the relationship between the learning experiences of students and the instructional approaches we are using. Evaluating the impact of your teaching is about measuring the growth in your students by comparing where they were at an earlier time with where they are now[6].As a teacher, you are determining what this growth means for each student. To do this, you can draw on

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evidence you have mapped to curriculum achievement standards, as well as knowledge of your students.To better understand and evaluate the impact of your teaching you can review with colleagues factors that might be enabling or constraining growth. This also helps school leaders to work out the dimensions of teaching that might need strengthening via professional learning[7].The teaching and learning process of traditionally run classrooms will need to change to meet up with the requirements under the reauthorization of the Elementary and Secondary Education Act as the Every Student Succeeds Act (ESSA). Under the ESSA, the infusion of the Universal Design for Learning (UDL) framework into the teaching and learning environment sets the stage so that instruction and assessment support all levels of learners. Along with UDL[7], ESSA supports the inclusion of technology-rich learning environments to prepare students for 21st century problem-solving and critical thinking skills. Critical to preparing students comes an understanding of who the 21st century learners are. The current teaching and learning process involving the use of technology continues to hold students back as passive observers of content. Merging technology and the UDL framework in the classroom will be an avenue to meeting the learning needs and wants of 21st century students.[8]

The rapid changes and increased complexity of today's world present new challenges and put new demands on our education system. There has been generally a growing awareness of the necessity to change and improve the preparation of students for productive functioning in the continually changing and highly demanding environment. In confronting this challenge it is necessary to consider the complexity of the education system itself and the multitude of problems that must be addressed. Clearly, no simple, single uniform approach can be applied with the expectation that significant improvements of the system will occur[9].

Indeed, any strategy for change must contend with the diverse factors affecting the education system, the interactions of its parts, and the intricate interdependencies within it and with its environment.As we consider these problems, we become increasingly cognizant of the various possibilities of using concepts and methods of the study of complex systems for providing direction and strategies to facilitate the introduction of viable and successful changes.[10]

II. DISCUSSION

A key insight from complex systems is that simple solutions are not likely to be effective in cases such as the education system, and that providing a balance or coexistence of what seem to be opposites may provide the greatest opportunities for successful courses of action. In the following we consider

- Integrating the commonly polarized goals of education; i.e. the goal that focuses on transmitting knowledge with the goal that emphasizes the development of the individual student.
- Adapting teaching to different student characteristics by using diverse methods of teaching. Adaptation to the ability levels, patterns of different abilities, learning styles, personality characteristics, and cultural backgrounds.
- Integrating the curriculum by developing inter-disciplinary curriculum units that enable students to acquire knowledge from different disciplines through a unifying theme while having the opportunity to contribute in different and special ways to the objectives of the integrated units.[11]

The approaches to teaching can be categorized according to major educational goals that affect teaching strategies. On one hand the goal of education is viewed as the transmission of knowledge by the teachers to the students. On the other hand the goal of education is viewed as facilitating students' autonomous learning and self expression. The former approach which converges toward the teaching of specified subject matter, may be termed 'convergent' teaching and the latter approach which stresses open ended self-directed learning may be termed 'divergent' teaching. The convergent approach is highly structured and teacher-centered; the students are passive recipients of knowledge transmitted to them and learning achievements are measured by standardized tests. The divergent approach is flexible, student-centered, where the students are active participants in the learning process and learning achievements are assessed by a variety of evaluation tools such as self-evaluation in parallel to teacher evaluation; documentation portfolios; and special projects[12] .

In the highly complex education system there may be various combinations of the different approaches to teaching and probably no 'pure' convergent or divergent teaching. Still, the tendency in the education system

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of today is toward the convergent approach. In fact, among the current suggestions for implementing educational reforms to deal with the considerable problems of the education system, there has been a strong emphasis on setting convergent goals, an aspect of which is the use of across-the-board standardized testing. Testing has been commonly viewed as a prudent way to determine the success or failure of the teaching and learning process. There has been a relatively limited use of other means of evaluation which are more complicated and more demanding in terms of application and interpretation.[13]

As educators seek ways to meet the demands put upon the education system in today's world of rapid changes and ever increasing complexity, it may be helpful to recognize that there is a need for both convergent and divergent approaches to teaching and learning. Educators who stress the importance of the acquisition of specific knowledge as a useful way to prepare the students for productive future functioning, must come to realize that even for the purpose of this goal alone, a divergent approach is needed today. With the great proliferation of knowledge and rapid changes in most fields as well as the appearance of many new fields, it is critical to develop students' capacity for self-directed learning and self growth. On the other hand, those who emphasize the importance of autonomous growth and creative self-expression, must realize that the students need academic skills (such as reading, writing, calculating, etc.) as prerequisites for productive self expression. Since the creative process involves new ways of using existing knowledge, it is important to provide opportunities for students to acquire such knowledge (which can be acquired by convergent teaching). Hence, convergent and divergent teaching strategies are both needed and the challenging question is how to find the balance between them within the complexity of the process of teaching and learning. It is likely that the two approaches may increasingly become not mutually exclusive but interrelated and interdependent.[14]

An important development is the growing awareness that academic achievement could improve by adapting teaching to students individual differences. This awareness is finding its most distinct expression in the education system's attempts to deal with the issues of students with special needs. However, other aspects of adaptation to students' individual differences get far less attention.[15]

In general, adaptation to individual differences under convergent teaching tends to be limited. The students are all expected to strive toward one goal of learning specified required knowledge; some may attain it and others may fall by the wayside or be given some remediation with limited results. Nevertheless, there are various possibilities of effective adaptation to individual differences under convergent teaching. In addition to adaptation in the rate of learning, where each student can be allowed to work at his/her own pace, there are many possibilities of adaptation through the use of diverse methods of teaching. Even when all the students are taught the same material, teachers can use different methods, different techniques or different media, to cater to individual differences in abilities and personality characteristics. Such a 'multi-convergent' approach can be more effective in giving the students opportunities to use their aptitudes and inclinations for learning and attaining higher achievements. As the students experience success and consequently a sense of competence, their motivation is enhanced to pursue further learning. Such an approach has a better potential for success than the common reality of students with learning difficulties, who often struggle through remediation with a sense of inadequacy and discouraging experiences of failure.[16]

Adaptation to individual differences under divergent teaching may be expected to be productive because of its emphasis on student autonomous, active, self-reliant learning. Yet, there are students who may not function well under divergent conditions because of their strong need for guidance, direction, and structure. Divergent teaching can cater to such needs by individual guidance, along with ongoing assessment and subsequent modifications. This is a 'guided-divergent' approach which is more structured and less flexible than the open divergent teaching but less narrow and limiting than convergent teaching.[17]

III. RESULTS

Among the most difficult problems faced by the education system are those associated with teaching effectiveness. The current preparation of teachers for specific age levels, specific subject matter, specific academic skills, etc., does not take into consideration sufficiently the complexity of factors such as students' various characteristics. There is a strong need to train teachers to adapt instruction to the diverse student abilities, learning styles, personality traits and needs by using more differentiated teaching strategies (See also Complexity in the Classroom[18] .

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In addition to the preparation of teachers to more differentiated teaching, there could be more divergent use of teaching resources. Worthwhile teaching can be done with advantageous results by persons other than the traditional classroom teachers. For example, valuable teaching can be done by peers of different ages and abilities. Also, parents, grandparents, and relatives could participate in and contribute productively to the teaching process. Furthermore, teaching can be enhanced by volunteers, retirees, people with various areas of expertise from the worlds of science, business, engineering, medicine, public service, entertainment, and others. Also, high-tech resources such as multimedia technology, computer programs, telecommunication, the Internet, audio-visual techniques, and others can provide beneficial options. Student learning can be greatly enriched further by traveling - near and far; interaction with people of different cultures; different geographical areas; different occupations, different ways of life; different outlooks. Undoubtedly, many possibilities exist that are not often implemented even though they could make the teaching and learning process more effective and more beneficial by providing a variety of experiences and alternative strategies for adaptation to students' characteristics.[19]

1. Ability levels and patterns of different abilities. Presently, the practice in some schools is to adapt teaching to different ability levels by forming classes or groups of students of similar levels (usually based on achievement tests or psychological tests) taught by teachers who tend to treat the students as if they were in homogeneous groups. Obviously, once a group of two students is formed, it cannot be considered homogeneous. Even if the two have an identical IQ, for instance, the profile of different abilities can be quite dissimilar and many other personality characteristics add to the dissimilarity of the students' attributes that affect their learning. The over-simplification of today's ways of adaptation to students' differences in abilities and other characteristics has resulted in many difficulties in the academic performance of many students. In some cases this has led to phenomena such as, "learning disabilities", "conduct problems", "attitude problems", "anxiety and school phobias". The complexity of this issue is apparent as one considers results of research studies or surveys measuring students' performance under conditions aimed at "slow" versus "fast" learners. The differences evident in rate of learning are only one aspect of the diverse effects of students with different abilities studying under different conditions. For instance, the type and manner of teaching has differential effects: students with higher ability tend to perform better under non-directive teaching methods while those with lower ability tend to do better under directive methods.[20] Furthermore, the multiplicity and differentiality of mental abilities must be taken into consideration when teaching at any level of the education system. There has been a growing acknowledgement of the importance of adapting teaching to a variety of intelligences (e.g. Gardner's work on the seven intelligences and Sternberg's work on the triarchic dimensions of intelligence; also see Goleman's work on emotional intelligence), as well as providing for special learning needs. The diversity of patterns of mental abilities is well recognized today, yet little has been done to develop adequate conditions aimed at adapting teaching to this diversity. It is possible to design instructional strategies and learning materials that provide options and flexibility for matching students' particular patterns of abilities. Thus, teaching strategies can be differentially facilitating various ability patterns. The interaction between specific aptitudes and specific teaching styles can be important in considering the various options of implementing changes in the teaching and learning process. Also, matching teachers' styles with students' ability patterns can have significant effects on students' attitudes, motivation, and achievements.
2. Learning styles and preferences affect the way students approach any task and the way they function under different conditions and different learning environments. Learning styles such as reflectivity/impulsivity, field-dependence/field-independence, and mental self-government, as well as preferences for interactive visual or auditory presentations, or other ways of representing information have effects on students' academic performance (See Kagan's work on impulsive and reflective cognitive styles, Witkin's work on field dependent style, Sternberg's work on mental self-government styles, and the work on computer simulations preferences). Some educators have begun to acknowledge the importance of adapting teaching strategies to students different learning styles, but no earnest efforts have been devoted to this promising endeavor. The adaptation of teaching to learning styles may include not only more appropriately differentiated teaching strategies but also may add to the dependability of the evaluation measures of what students have learned. Thus, the effectiveness of teaching and the pertinence of the assessment of learning achievements can be enhanced by teachers' adaptation of instructional strategies to students learning styles.[21]

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3. Personality Characteristics. To some extent there is recognition among educators that personality characteristics such as self-reliance, attitudes, anxiety, independence, emotional stability have differential effects on students learning achievements. There is some acknowledgement that attention should be paid to students personality needs and to particular aspects of students different cultural backgrounds. Nevertheless, while the effect of personality characteristics on learning is significant, very little has been done or even suggested regarding the adaptation of teaching to students different personality traits and needs. Among the reasons for that is the very large number of traits with a wide variety of tests to measure them and the problem of their lower validation than the ability tests. Also, the complexity of the interactions of personality characteristics with various other factors affecting learning seems too difficult to tackle. Many educators and educational administrators are convinced that it is very difficult to implement multi-dimensional teaching strategies in the classroom. However, it is possible to analyze the interactions between students' and teachers' characteristics and closely examine the resulting different learning outcomes. For example, students of higher ability levels who are also self-reliant, independent, with lower anxiety tend to do better under divergent teaching and self-directed learning conditions, while students of lower ability levels who are also dependent, and anxious, tend to do better under convergent teaching with clear structure and much direction. Such interactions need to be explored further to find more about the various factors affecting the teaching learning process. The outcomes of such exploration can be very helpful in the search for enhancing teaching effectiveness and students achievements.[22]

In sum, the attempts to match teaching strategies with students characteristics may become critical steps toward dealing with some of the particularly difficult problems of the teaching and learning process. Admittedly, many difficulties are faced not only by teachers but also by administrators and policy makers in the endeavor to adapt instructional strategies to students characteristics, but the methods and concepts of the field of complex systems can provide ways of implementing such changes in the attempts to introduce reforms to the education system.

IV. CONCLUSIONS

One of the most exciting developments in the world of science today is the growing involvement of researchers in interdisciplinary collaborations, and the increase in cross-fertilization of ideas and research endeavors of people in different fields of science.. The benefits for cross-disciplinary scientific work are invaluable and the various application possibilities are promising not only for science but for many aspects of daily living.

These developments have direct implications for the education system. The tendency in our schools is to teach bits and pieces of information related to particular disciplines. In view of the cross-disciplinary trends, the curriculum can be integrated around topics that reflect the patterns, interactions, and interdependencies of the different fields. This can provide students with ways to study and attempt to comprehend the world around them through concepts and ideas that are less disparate or disconnected.[23]

The growing inter-disciplinary collaborations and cooperative sharing of information from different fields and the efforts to find pragmatic solutions to global problems have further implications for education. There are important implications for the preparation of students to function and be productive in a world with diverse populations, different economic conditions, multitudes of cultural, religious and ethnic groups, and many other different factors. Furthermore, it is highly beneficial to begin early in the educational process to organize learning around problem solving, critical thinking, and dealing with issues arising from different fields of study and different aspects of real life conditions.

An integrated, inter-disciplinary curriculum links a variety of learning subjects as they are related to the topics of integrated curriculum units. The emphasis on connecting and synthesizing information around topics of interest to the students provides favorable conditions for the acquisition of knowledge from different disciplines through congruous concepts and ideas. Integrated curriculum units are chosen by the students with the teacher and involve teams of students working cooperatively toward common goals. Small groups, pairs, or individuals can work on relevant tasks and materials that can be shared with the other students and yield peer-to-peer learning. Experiencing the benefits of contributing to the goals of the unit by members of the

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team is empowering and gratifying and is also a beneficial way of preparing them for future functioning in the world. Moreover, the opportunity given to each student to capitalize on his/her strengths can become a strong motivating factor in pursuing further learning and further giving to others.

In terms of teaching strategies, an integrated curriculum encourages a multi-dimensional approach to the educational process and tends to combine regularly multi-convergent and divergent strategies of teaching. There are also various options in the way teachers are assigned to classroom teaching. Individual teachers may find it difficult to implement multi-dimensional strategies in teaching any class, even when small in size, but teachers can work in teams using different teaching strategies compatible with individual teachers' particular capabilities, cognitive styles and personality characteristics.. They can also organize various teaching experiences with the assistance of volunteers, specialists, peers and others who could contribute to the teaching process. In terms of the structure and settings adapted to different teaching and learning conditions, there can be alternative places for learning, e.g. learning centers, laboratories, libraries, outdoors, community institutions and businesses, museums, and various organizations[24].

The structure and organization of the student body can be in the form of small and large groups; study pairs; and individualized study arrangements. Social alternatives are possible in heterogeneous groups with a great deal of interchange within them and between them and other groups. Clearly, student groups may vary in age, cultural and socioeconomic background, special interests and special needs.

There are various alternatives in the types of learning that an integrated curriculum can include:

1. Required subjects and basic academic skills some of which are taught in a convergentway, using, in addition to teachers' didactic presentations, programmed instruction, multi-media technologies, computer programs, videos, and other techniques involving technological innovations.
2. A number of required subjects and academic skills can be taught in a multi-convergentway where methods of teaching are adapted to students' different abilities, needs and interests. For example, different intelligences may be emphasized such as, linguistic intelligence, logical-mathematical intelligence, spatial intelligence, musical intelligence, bodily-kinesthetic intelligence, and others.
3. A major part of the program can be devoted to integrated inter-disciplinary curriculum units chosen by teachers and students together. These units enable students to acquire knowledge and skills associated with different disciplines through congruous meaningful learning revolving around a topic of interest to the students. The work on the units is undertaken by groups of students who are encouraged to take active part in the decision-making process and focus on aspects of the units in which they can best develop their capabilities, satisfy their interests, and fulfill their needs. Each student is given the opportunity to use their strengths (academic or non-academic) to contribute to the common goals of the group. In working on these integrated units, guided divergentteaching is used as needed. At the end of a period of work on the unit, the group can celebrate with other students, parents, administrators and others involved in the school, the conclusion and accomplishments of the work on the unit. Each student in the group is encouraged to contribute whatever they can to such celebrations by presenting their work through various performances, presentations, exhibits, videos and other contributions to the festive activities. Such celebrations can become useful ways of evaluating the students' learning achievements[23]
4. Individually chosen projects where the students can work on topics they have chosen and where they could apply their strong skills and competencies, wherever they lie. Students can be encouraged to present their work on their project to the group in any way compatible with their tendencies. The students can present their work to their peers and teachers as an exhibit, as an oral presentation, as written material, as a play, a video, or any other means of communicating and disseminating information. Divergent teaching is the approach used for those individually selected, and often independently pursued, projects.

The above discussion of ways to implement various changes in the approach to teaching and learning grew out of the recognition that the current attempts at reforming the education system tend to be ineffectual. The attempts to use simple large forces (such as standardized testing, for example) in dealing with the ills of the

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complex education system are essentially doomed to fail. Undoubtedly, there are no simple general solutions to those multifarious complex problems.

The above suggestions of some different possibilities of implementing changes, stem from the conviction that such special, differentiated approaches can be very beneficial and can have significant positive effects on the teaching and learning process in our education system.[24]

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