

Studying the Relationship between Teaching Models and Research-based Thinking Development

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ABSTRACT: Curricula expert believe that a superficial perspective incurring ignorance about the human beings and their essence which in turn empty the mental vision and conceiving of human complexities should be set aside and evaded because the output will be prescribed and directive-factory curricula and teaching methods. And the learners will be conditioned to a kind of unstable education/training with no sustainability. In this article, the questions below are raised considering inefficiency of directive and prescribed-factory curricula encountered with globalization process, information explosion, teaching complications and life styles opportunities: How can learning opportunities and developing research-based logical thinking in conformity with globalization be provided through curricula? How can the ability to adopt correct and valid information and dismiss invalid information along with proper selectivity be instituted in learners? The objective of this article is to explain the relation between four categories/families of teaching models as follows: Information processing, social, personal(individual), and behavioral systems studied in a format of 28 patterns with cognitive training plus developing bearing in mind the major duty of Teaching-Training system which shall be instructing the learners as "how to Learn". The research results indicate that the teaching methods above - already formulized tested and surveyed in the modern era of educational research - do not function passively facing the desired development of research-based logical thinking and enhancing the judgment capacity of the learners. Moreover, the three dimensions of stimulating teacher, teacher' command over various teaching models and taking into account the individual differences of each learner shape a triangle in the middle of which research-oriented logical thinking is to be born.

Keywords: models of information processing, social, personal /individual, behavioral systems, logical thinking.

ORIGINAL ARTICLE

INTRODUCTION

Restoring our country's majestic status in the past encompassing its greatness and scientific supremacy accompanied with steps taken toward Iran's scientific advancement and actualization in a way safe-guarding Iran's true position as a pioneer in terms of constituting human civilization calls for shifting the teaching curricula and trends toward the teaching patterns and models which put stress upon logical thinking. The existing indexes indicate a direct link between scientific researches given priority in certain countries and progress of knowledge (scientific breakthroughs) and technological advancing within such countries. Undoubtedly attending to research also deeply correlates with the extent of researching spirit development and capability to discover the unknown across all social strata. Effectual and efficient training/education is the one which teaches how to

learn and unravel mysteries so that ignorance is overcome by the learners. Hence, it can be claimed that adopting research-based thinking approaches within training/education process secures its increased effectiveness and signifies proper reaction to conditions brought up by globalization and scientific revolutions. Ever-increasing expansion of technology in various aspects of everyday life along with fast and successive changes in occupations, professions, instruments and also the consequent social and economic effects resulting from them constantly bring up mind-boggling puzzles and never-stopping crises that human beings are to encounter and handle. Dealing with and challenging such complicated events in a way that social, moral, occupational, personal and spiritual balance is maintained in this world of never-ending changes necessitates more and more concentrating on nurturing and fostering research-centered mentality

and logical thinking combined with acquisition of skills so that the world's enigmas may be encountered scientifically and thus the learners could be trained and prepared for competent dealing with this changing world and globalization. Today, learner is referred to a person who is well capable of searching for extra information and academic contents through printed/non-printed and electronic resources after adequate benefiting from the educational materials provide to her/him by the relevant curricula (Heidary, 2007). Therefore, the mission of training/education establishment is to foster and develop rational competency or up-grading logical reasoning of the learners (Shariatmadary 2001). In other words, training/education establishment should teach "How to learn". It should also foster/nurture research skills and utilization of the resources available which means group-work, learning how to get in touch with teacher including the superintendents and society, the way data-bases and the Internet should be navigated, how to use educational textbooks and references, getting to know manners of learning from the world's phenomena directed at becoming better knowledgeable (Ghadiry Bashardust, 2003) all in all may have their roots in teaching/training models. In short, training/education specialists and experts should evade a superficial, industrial/technological/factory-minded and standard perspective which amounts to no perfect recognition of human beings and the essence conferred upon them. They are strongly recommended to refrain from resorting to such non-comprehensive viewpoint depriving them of insight into human complexities which ends up to teaching models and methods that are all of a directive/commanding and pre-determined /factory-minded nature (E.Eisner, 1994) breeding the learners with a sort of unsustainable teaching that superficiality and parrot-like memorization its accompanying. It should be noted that human learning faculty is so complicated and spans over a very huge arena and domain so we had better to get into the domain of learning psychology and other relevant fields for the purpose of further study and research (Parvand 2004).

Educational curriculum in the globalization era should be of dynamism and a speedy tempo. It means that the proper curriculum has been enriched /empowered with reasonable speed and effectiveness regarding the actions to be taken targeted at challenging inconformity crisis and lack of meaning. (MehrMohammadi 2008). Dynamism of great momentum does not mean lack of academic, professional honor-saving positioning, unjustified risk-

taking and conditioned by politics. Any teaching approach or curriculum devoid of such dynamism will definitely lack in the required effectuality. In the globalization era curricula should be of the essential flexibility, problem-centrism, variety and plurality. Since providing learning opportunities play a very important and crucial part in all appropriate curricula considered; the teaching/training models and approaches should transcend all superficial, industrial/technological/factory-minded and standard perspectives.

Professor Maatuba, university teacher and specialist of national educational curricula in Japan believes: "textbooks are important, yet teacher is more important than any." Competent use of teaching models and methods manifests a meaningful correlation with the teachers' characters, their expectations and performance(s). A great deal of research has been conducted for the purpose of surveying teacher's enthusiasm and maneuverability effects on the quality of students' learning capacity. They have all presented abundant proofs that such merits positively affect learning process. Learners benefiting from such teachers show better progress and higher level of satisfaction with teachers' method of learning (Seiff 2005 Shivelson 2001).

With regards to studies conducted by Rozental and Jackibson over surveys appertaining "Teacher's Expectations Effect" due to evidence obtained the conclusion is expressed thus: those students that were expected by teachers to reach a higher level of mental agility managed to show a better performance as compared to other classmates. So many teachers instructing the learner how to act with dynamism and creativity which is founded on conviction: "knowledge-acquisition is a process" and not "an output" articulated their opposition to "teacher-based" methods that largely depend on imitating and transfer of formatted / pre-determined information. They strongly advocated "learner-oriented" teaching methods that put stress on learners' implementing their own sensing/analyzing mechanisms in an active manner through participation in the learning process (Shahraray 1991). Teaching may be defined as a process by which a person called the teacher acts as the medium connecting the learner to the nature of world so that the learning and world recognizing shall be better facilitated (Yarmohammadian 2009). Therefore, teaching is perhaps actually to increase the learners' mental capacity to achieve essential capability of gaining knowledge best in the future due to skills and basis academic data obtained and also their

mastery over the learning process itself (Joyce and Colleagues, 2006).

Teaching approaches/methods are of great variety and offer an extensive range of teaching methods which bring about different outcomes, accordingly. Hence, those teachers who have mastered larger amount of such teachings logically perform much better in terms of developing research-based mentality and logical thinking of the learners. Maria Montesurry believes what makes any person a human being (of the ideal/deserving position) is not limited/excluded to her/his teachers but the tasks that he/she manages to accomplish on her/his own (Miller 1990).when the teaching materials are presented to the learner in the form of problems the learning person finds himself/herself in a position of researcher acting independently while he/she should try to get linked to the teacher for instruction together with drawing the classmates into cooperation. Thus, the habit of scientific approaching the world's phenomena will be solidified within the learner and gradually the spirit of science-orientation constructively infiltrates. (Mehrmohammadi 2002). In various resources the importance of boosting deep-reflection and profound learning of the learners have been emphasized (Joyce and Colleagues 2006). Some of the reasons justifying the application of research-based thinking models of teaching are mentioned below (Salsabeelee, 2006):

1- Inducing the drive/motivation within the learner; getting connected to learner's internal world; encountering a real problem and imbuing a sense of surprise and bewilderment 2- Meaningfulness and sustainability of the knowledge acquired resulting in achievement of knowledge as part of the whole learning process. 3- rational/mental training/culturing originating from thinking and correct judgment; also implementing the educational materials and methods that help learners face real/concrete issues/problems. 4- Learning transfer and applying what is learnt in new situations; also enhanced capacity for tolerating ambiguities and complexity along with pursuing their solutions. 5- Achieving various goals of learning in logical, emotional, social and moral areas.

Regarding the importance and status of researching approach (Van Fvsn and Shyvly 1997) argue as follows: 1. Research-based instruction/teaching (exploration) for a long time has been supported as is useful and effective strategy 2. Research-based teaching helps to nurture children's natural desire to research and investigate 3 - "Investigative "teaching and problem solving will develop many basic skills. Where teaching methods and models are based on

research-based thinking, the learner is more active as compared with applying explanatory teaching methods. Through such teaching approaches, the learner should organize the information acquired in a meaningful manner so as to find solutions to specific problems or find out the constructing relationship between different factors. (Levy, 2002) highlights four major features of the research-centered thinking (heuristics) in the following scheme: 1 - The mental ability: upon learning any principle through research-based thinking (heuristic method) the learner willingness to use it for the ask of solving problems will be increased.2- motivation: the learners get more satisfaction when this method is implemented, thus there are more motivated for better learning.

3 - Students learn the rules of problem-solving and how to get over complexity.

4 - Knowledge that can be achieved with this method is easier to remember as compared to explanatory method. Also on the goal and objective of curricula (Taghipour Zahiri, 1999) in the training process it can be said that the curriculum is to provide opportunities for learners to benefit from maximum participation in learning activities selected. If the learners attend the learning opportunities and activities devised and provided, no matter whether these opportunities are designed by the planners or at the school by the teacher, or teacher with student participation, learning experiences shall be enjoyed and benefited from which result in personal growth. Paulo Freire offers his definition of oppression in the following expression: (Miller, 2003) "an act is oppressive when it blocks the path to become a human being or hinders growth of human characteristics". In other words, the performance of the schools where the students are kept dependent by applying tools like punishment and scoring should be criticized.

The goal of this article is to reflect upon the relationship between teaching methods and research-centered thinking development so that attention is drawn to this subject.

MATERIALS AND METHODS

In this research by applying meta-analysis method and also deduction taking into account research results, assays, reliable web-sites, theories and various approaches in the area of learning theories and teaching patterns/models all the endeavors have been directed at presenting a novel expounding of the role that teaching patterns/models play in terms of developing research-based thinking. In particular, four

teaching patterns/models relationship: 1- Model of Information Processing, social Model, personal / individual Model and behavioral systems Model have been studied and surveyed.

Questions:

One - How can the in the context of curriculum, learning opportunities and development of logical/research-oriented thinking in conformity with globalization be provided? Two - How the ability to choose correct and valid information from invalid data - efficient selection rather than wrong selection -be developed in learners?

RESULTS

Articulation of the role of teaching models family in learning opportunities provision based on research-based thinking:

Those programs and models which hinder the learners' creativity and understanding their own poison in the world and further complicate solving personal/social problems actually have neglected the true needs of people (Saylor and colleagues 2006). In this research for the sake of regulating the studied carried out about important sources of models, they are divided into four families considering people-analysis outlook(s) and ways to teach them on the basis of the learning approach adopted (Joyce and Calhoun 2006).

These four families/categories are:

Family of Information Processing Models, family of social Models, family of personal Models, and family of behavioral systems Models:

A-Family of the Information processing models

A model that cognitive psychologists generally accept is the information processing model. Cognitive models including information processing model, are in fact heuristic tools to organize the existing body of literature, encouraging further study, leading research efforts, facilitating and establishing contacts between scientists. The information processing model is actually effective in line with the above-mentioned goals and objectives. This model assumes that cognition can be analyzed through a series of stages. Each stage represents an imaginary entity where (within which) some unique and specific operation(s) is/are applied onto the input information. With regards to boosting the skills needed for collecting information it can be said: early stages of environment data processing calls for the child's ability to pay due attention to relevant

given data, appreciating them and then have them probed. Successful data absorption utilizes processes such as sensory registration, focal attention, processing speed and effective strategies for probing and exploiting the information across different parts of the work environment. (Solso 2002 P500) has put stress upon Information processing models, human inner desire to understand the world by getting access to data and their organizing, understanding issues/problems and offer solutions to them, concepts presentation and proper time of their transfer. Some of the models in this family provide learner with data and others emphasize

how to build concepts/knowledge and test the hypotheses while some strengthen and boost cognitive capacity and creativity (Joyce and Calhoun 2006). As the title of this family may imply such models help learners either by operating on data gained directly through experience or mediating resources so that they can conceptually apply self-control over their specific studying fields. Table one depicts family of information processing models relationship with development of logical thinking.

B-Family of Social Models

A large part of human learning is conducted through observing others' behaviors and what they do. The most important learning theory now existing that stresses observation importance has been offered by Albert Bandura. Bandura's theory was presented in a book written with Richard Walters' collaboration. The reason behind referring to it as social learning theory is that the social fabrication/context in which behavior is learned/adopted and maintained has been highlighted and attributed utmost importance. This theory emphasizes the mediating cognitive processes and it is assumed that effects of environmental events upon acquisition and orderly organizing the behavior are all determined by such processes (Seiff 1994). On occasions where we work together, a kind of collective energy is created which is called synergy. Devising models for the social family is aimed at optimum use of this phenomenon by instituting proper learning communities and groups. In terms of scientific/cognitive developing, such models enable the learner to benefit from the viewpoints of others around - either individuals or teams - and have their own thoughts/impressions concerning them clarified and better expanded. Table two depicts family of social models relationship with development of logical thinking.

Table 1. Studying the relationship between family of the Information processing models and development of logical thinking

The Titles:	Type of links to Research-oriented Thinking	Direct and indirect effects on Research-based thinking
Inductive thinking;	Nurturing/fostering skills, classification; constructing theories and having them tested, and also manners of attaining conceptual-recognition of the contents offered by the curricula;	<p>Direct ones:</p> <ul style="list-style-type: none"> - Concepts and conceptual systems, along with their application - The concept development process, information, concepts, skills, and develop hypotheses - The concept of learning strategies - Capable of decoding problems, tools for thinking metaphorically, group cohesion and productivity - The methods of scientific exploration in the hands of a skilled teacher is a very diverse and comprehensive. Such a manner that can be objects of scientific research in all subjects with social interaction and social learning process in the blends. - Students are encouraged to conventional ways of thinking through the non-passive surrender to mental states such as fantasy, unrelated thoughts and ideas to break symbol. (Saylor and others 2006). <p>Indirect:</p> <ul style="list-style-type: none"> - Develop logical thinking - Awareness of the nature of knowledge - Spirit probe - Tolerate ambiguity - Inductive reasoning - Conceptual flexibility - Success in learning the curriculum content - Reinsurance and its independence - Self-awareness - Self-esteem - Development of creative writers, explore social and disciplinary problems, understanding the relationship between individuals and conflicts between them, creating a model or product, expanding the vision of a concept
Concept learning;	Concept learning and studying on strategies conducive to attaining conceptual-recognition of the contents offered by the curricula and their implementation,	
Scientific investigation /probing;	Constructing theories and having them tested; Learning the researching system of academic disciplines, how knowledge is constructed and organized, up-grading the process of discretion in learners, team reaction to a problem and its solution, learners specify certain problems, having them formulized and keep track of it till final solution (saylor and colleagues 2006);	
Teaching investigation /probing;	Causal/causative reasoning and understanding how to collect information, concepts recognition, constructing theories and having them tested;	
Cognitive growth /development;	Boosting cognitive transformation in general sense and regulating the teaching task in a way that cognitive growth is facilitated;	
Improvisation;	It is a pleasing method for training/developing creative thinking, a strategy for enhancing creativity, imbuing dynamism in class group, innovating new matters/affairs through application of analogies aimed at discerning the old problems and products in a novel perspective/horizon, familiarity with unknown/unidentified issues by utilizing familiar syllogisms;	
Pre-organizer (pioneer);	It has been devised for developing information absorbing capabilities and having them organized particularly on occasions that learning through lectures and reading is concerned;	
Boosting memory;	Up-grading the power of attaining information, concepts, conceptual systems and applying cognitive control over information processing ability, enduring success and memory fortification, they contribute to information processing ability and provision of mediatory links to contents to be remembered; Skills needed for problem-solving established (Solso 2002)	

Table 2. Examining the relation between family of Social Models and logical thinking development)

The Titles:	Type of links to Research-oriented Thinking	Direct and indirect effects on Research-based thinking
Group/collective investigating the information gained from direct experimentation	Fostering the skills related to participating in democracy process, simultaneous emphasis on social growth, scientific skills and learner's personal depth of understanding	<p>Direct ones: Group process and management, construct-oriented perspective absorbing science, research order based on cooperation, sympathy and respect;</p> <p>Analysis of individual values and behavior; strategies for solving inter-personal problems;</p> <p>Indirect ones: Independency/self-reliance as learners, respect for others' social status and honor, social research as a style of life, sincerity and solidarity of interpersonal ties, relaxed feeling of safety in expressing one's own ideas, skillful negotiating;</p>
Social studies investigation following the procedures applied by judicial establishments	solving social problems by group/collective scientific studies and rational reasoning analyzing issues appertaining policies by implementing judicial frameworks, collecting information, question analysis and weighing standpoints regarding values and study their own personal beliefs/convictions, proper application of facts instead of learning a series of ad hoc/random realities or through associated metal images (Levy 2002)-learners will be able to have issues related to public policies analyzed in an intelligent manner and adopt their own stance(s) along with commenting on them (saylor and colleagues 2006)	
Laboratory method	Insight into group dynamism, leadership and realization/appreciation of others' personal styles and methods, acquiring skills that learning process has targeted (Levi 2002)	
role-playing;	Study the values and the roles they play in social interactions, understanding their own relation to others and emotional impacts	
positive interdependence;	Nurturing the strategies indicative of interdependency of social dealings and interactions, understanding their own relation to others and emotional impacts	
Organized social studying;	Scientific studies together with individual/social growth, collaborative strategies regarding scientific studies	

C-Family of Individual (personal) Models:

Learning is an activity conducted internally and within each human being. Results from learning may be measured only through changes that occur in learner's behavior. Despite this very fact, lots of official curricula and teaching model have teacher's attention focused on the group instead of the individual. The majority of training/education psychologists recommendation is that learning should be designed and customized in a way that each single learner may be able to get engaged in learning process on her/his own. Any certain learner's learning drills and expected level of learning shall be determined on the basis of his/her capabilities and

interests (Levi 2002) .Personal models stresses each human being's unique and specific features, manners and character and target the culturing of a type of personality with highest consistency and integrity enjoying self-confidence. The main objective is to help learner feel possessing as to development and trained/cultured personality and a attaining a sense of "self-worth" and individual harmony (Joyce and others 1997). Models of this family are directed towards combining emotional and rational features of the learner's character. Table 3 depicts the relation between Family of Individual/personal Models and Social Thinking Development.

Table 3. Examining the relation between Family of Individual/personal Models and Logical Thinking Development

The Titles:	Type of links to Research-oriented Thinking	Direct and indirect effects on Research-based thinking
Non-directive/commanding teaching	Capacity built-up for personal growth, insight into one's character, self-reliance and self-esteem	<p>Direct ones: direct and indirect effects on research-based thinking direct ones: coherent relationship, integrity/consistency with regards to establishing contact; self-awareness and reflection; self-development (Joyce and colleagues 2006) individualized instruction curricula may be devised taking into account the specific interests and capabilities of each certain learner (Levi 2002) Learner typically gets the projects outlined/designed and executed through the least guiding aid and supervision of others.</p> <p>Indirect ones: self-esteem, educational and social motivating the ability to learn and progress- respecting the learners' ideas and convictions; directing irrelevant questions towards the main issue/problem (Yarmohammadian 2009) - high level of emotional and cognitive growth/development is attained, advancing competence in a particular studying field, enhancing self-leadership and learner's capability for future learning's - the capacity of having one specialized aptitude or ability better actualized in the learner, preparing the learner for advanced studies in a specific field</p>
teaching consciousness/awareness	Increased self-consciousness, integrity, skilled exploration/probing, sharpened inter-personal sensitivity and sympathy	
Class meeting	Culturing self-consciousness and responsibility for one-self and others	
Self-actualization	Developing personal understanding and growth capacity	
Conceptual systems	Ever-increased power of getting access to complicated yet flexible mechanisms of processing information including manner of interacting with others	
Providing individual-tailored educational sets/curricula that are fully organized	Drills assigned to learners should be decided upon on the basis of diagnostic tests done on each certain individual learner so as to have them suitable best when level of learner's already acquired knowledge is accounted for, in case learner's level of collected data is well-acceptable then the exercises will be more difficult	

D-Family of Behavioral systems Models:

Behavior change is referred to as a set of methods and techniques that are extracted from experimental psychological discoveries/finds, particularly the learning psychology and its objective is to remove persons' adaptability problems under various conditions of personal and social life (Seiff 1994). B.F.Skinner the most famous contemporary behaviorist believed – just like Watson – that the only subject-matter fitted for psychology is "Behavior". And the only factor which constructs and maintains behavior is the environment. This outlook that we find the example of Skinner (1961) as one representation is based on a

definition for learning: An observable change of behavior (Romiszowski 2000). Desired/acceptable behaviors are taught through a sequence of successive estimations beginning from an established behavior ending up to the desired behavior. The aim of behavior change has been summarized in four categories (Hergenan 2003): 1- Methods for increasing the power of desired behaviors, 2- Methods for incurring of desired behaviors, 3- Methods for maintaining desired behaviors, 4- Methods for decreasing and removing of undesired behaviors. Table 4 depicts the relation between family of behavioral systems and logical thinking development.

Table 4. Examining the relation between family of behavioral systems and logical thinking development

The Titles:	Type of links to Research-oriented Thinking	Direct and indirect effects on Research-based thinking
Social learning	Behavior management, acquiring new behavior patterns/models, behaviors indicative of neurosis(fears due to mental ailments) or other types of destructive behaviors reduced, learning self-control (Joyce and colleagues 2006). Self-efficacy built-up (Seiff 1994).	<p>Direct ones: Knowledge self-acquisition capacity and curriculum-related skills, self-confidence of the learner, learner active involvement with answering the questions;</p> <hr/> <p>Indirect ones: Responsible reaction to feedback, independence and self-reliance of the learner, sensitivity to cause-effect relation, providing enough learning opportunities for learner, learning task becomes easier, constructive effect on academic learning and mental growth (Anastazy 1990), the learners feeling competent can achieve more successes, the ability to learn abstract concepts such as competition, sympathy, social order, ability to acquire new skills and critical mentality/thinking</p> <hr/>
learning mastery level	Learning up to a level that full command over scientific skills and various types of curricula contents is secured, identifying and diagnostic tests held for determining the learners level of mastering research-centered thinking, specifying the areas that call for extra teaching/instruction.	
Programmed learning	Learning skills, concepts and information related to facts and realities, rectifying learner's mistakes/errors during her/his research through immediate notification.	
simulation	Learning/acquiring skills and complicated concepts in a wide range of disciplines/studying fields, application of rules for a semi-real problem, exploring different solutions by learner and comparing their relative merits and advantages led to suggestion of a specific one in the research process, opportunity provided for reply to life-like situation and observing information feed-back, opportunity for direct-learning through learner's own experiences/experimentation provided.	
direct teaching	Acquiring skills and scientific contents in a wide range of disciplines/studying fields.	
stress reduction	Controlling unpleasant reaction, application for treatment and self-healing, learner's peace of mind and less feeling alien to research/exam conditions, up-grades level educational progress, positively affects learners' performance.	

DISCUSSION

The goal of this research has been to study and examine the relationship between teaching methods/models and research-based thinking. Through this research (project) the analyses/deductions conducted by utilizing a variety of approaches and reliable textbooks – taking into consideration research outcomes with regards to various theories of learning models/methods – indicated that: the teaching methods/models do not function in a passive manner concerning the development of research-centered thinking; they play an effective part and are related to each other (correlation/interaction). Also it can be said that: a) mastering various teaching models/methods and having command over them, b) paying due attention to the principle of individual differences of

learners in a variety of areas including their different interests and have this principle considered, c) teacher's power of motivation, acting energetically and filled with dynamism constitute a triangle in the middle of which resides logical and research-oriented thinking. Life's difficulties, the changing world, social conditions and professional responsibilities bring into light the necessity of solving the problems by logical and research-oriented thinking. By implementing the kind of teaching methods/models that culture/foster logical and research-oriented thinking, learners may reach the ideal stage of finding out the right and valid information and dismiss the invalid ones and thus they will act successfully in constantly encountering/challenging the difficulties and problems of life. Based on current study

results, it's recommended:1- The more the number of teaching models that the teacher masters the more desired curricula/educational materials designed and implemented for learning process (learners)

2- Existing learning opportunities provided by curricula/educational materials should transcend the typical standards and be of variety, flexibility and plurality.

3- teaching should be presented in the form of "problem" and help the learner personify a researching character as to encounter it, while benefiting from teacher's instructions/guidance he/she draws other learners' contributions into his/her own learning endeavors.

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