



A Translation Instruction Model from Behaviorism, Cognitivism, Social Constructivism and Humanism

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Abstract

This article proposes a Translation Instruction Model for undergraduate translation programs. This model integrates principles derived from behaviorism, cognitivism, social constructivism, and humanism as ingredients that permeate the components involved in translation instruction: objective(s), assessment, teacher, student, material and methodology. Also, translation learners of different levels of readiness (beginner, intermediate, and professional) will be taken into account in the translation instructional design based on the given model. Specific exemplified approaches will be given on the basis of the principles found in behaviorism (e.g., programmed instruction), cognitivism (meaningful learning), constructivism (Vygotskyian social constructivism), and humanism (e.g., cooperative learning or individualized instruction). This model also provides general guidelines for practical instruction for a two-year translation program on undergraduate level.

Keywords: translation instruction, programmed instruction, scaffolding, communicative translation competence

Introduction

There has been a lack of sound, consistent pedagogical and methodological criteria in the field of translation teaching and its course design, which may result from the fact that translation has not enjoyed a similar academic status when compared to that of other disciplines (Colina, 2003: 1). On the other hand, the amount of teaching assigned to the part-time instructors hired for their professional experience is without common pedagogical tradition (S'eguilot, 1991: 80). That is, the translation experts who are in charge of translation instruction are not often equipped with common methodological or pedagogical principles behind their current teaching practices (Seguilot, 1991; Kiraly 1995: 10-11).

Translation instruction may, as in other general subject instructional areas, adopt a variety of instructional approaches evolved from distinct theories; for instance, programmed instruction^[1] on behaviorism^[2], scaffolding learning^[3] on social-constructivism^[4], and collaborative learning or open classroom^[5] on humanism^[6]. Teachers may concoct their own set of skills from various approaches that they perceive will meet their individual needs. A comprehensive model of effective translation teaching in which all the indispensable elements and procedures involved are integrated into a coherent whole is needed at this moment. Most individual methods based on principles of behaviorism, cognitivism, social constructivism, or humanism are, more or less, contributive to translation instruction, admitted that their effectiveness is still confined to certain situations. For instance, scaffolded learning can be the most effective means for student translators (or learners of low or intermediate levels of readiness) to gain experience since it is relatively hard for these learners to discover solutions to the difficult translation tasks they may face. Likewise, it is also not common for programmed instruction to be effective for intermediate or advanced learners in real-world situations. Translation teaching per se is a multi-dimensional issue where learners' varying levels of readiness, features of types of translation tasks, translation teaching objectives, translation assessments, translation learning material, or the translation teaching methods adopted, should all be seriously taken into account. Translation instruction that strictly adheres to any single approach or theory will not work in all the translation conditions that are met within the translation profession.

The components

The Triarchial Translation Instruction Model adopts firstly the general principles found in three components of behaviorism, cognitivism, social constructivism, and humanism. These ingredients are then elaborated as part of the dynamic relationships among the three pairs of components in coordination with translation learners' different levels of readiness.

As indicated, translation teaching cannot be complete (i.e., to be of any real effect) without consideration of all the components involved in the instructional settings as a whole. These components can be further presented in three pairs: objective-assessment, teacher-student, and material- method. Note that these components work in correspondingly adjacent pairs; that is, objective comes with assessment, teacher with

student, and material with method. It is fruitless for teachers of translation to give exams (as students' assessment) without prior and advanced specification of the learning objectives to students, the nature of the relationship between teacher and student, and the pedagogical link between material and method. A constructive teacher-student interactive relationship contributive to learning may exist only if the individual differences of both the translation teacher and the translation students are considered. Likewise, structures of translation teaching materials must also be corresponding to translation teaching methods (e.g., presentation procedures and teaching skills in coordination with students' levels of readiness and distinct learning styles). In general, these three pairs of components must be regarded as mutually interdependent and interactive in the dynamic of translation is to be maintained.

On the other hand, each component involved in the instruction may also cover the principles derived from behavioral, cognitive, social constructive and humanistic school of thoughts as ingredients. For each component, there are four ingredients, as illustrated below:

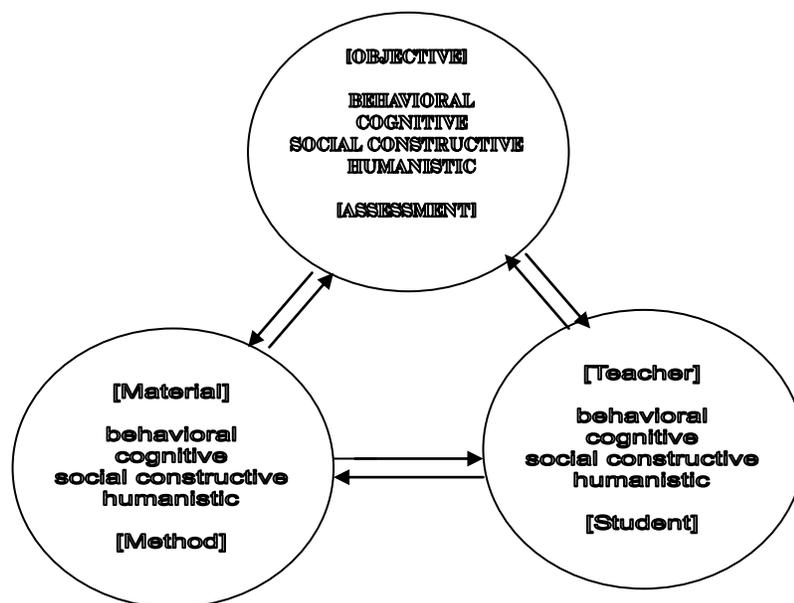


Figure 1. Three ingredients in three pairs of components

Note, in the above diagram, that there are multiple correspondences or interactions within and among the three pairs of components and with the ingredients. For example, the ingredients found in the materials may correspond to, or interact with, those in the objectives; behavioral ingredients covered in material will be included in the behavioral

realm located in the assessment portion, in addition to the cognitive ingredient located in the cognitive realm and humanistic ingredient located in the humanistic realm. The features of these three distinct ingredients, as well as their dynamic relationship with the six components, can be seen as elaborated below.

Distinct ingredients

In stimulus-response association (S-R), classical conditioning^[7] mainly focuses on the combination of different stimuli (e.g., a bell ringing and meat scraps for the dog, as found in Pavlov's classical conditioning experiment), whereas operant conditioning^[8] places emphasis on the reinforcement posterior to the desired responses (R-R); (e.g., pressing a bar, followed by the food, as a form of reinforcement provided to hungry mice, as found in Skinner's (1935) instrumental conditioning experiments). Such S-R or R-R (Response-Reinforcement) paradigms, as well as its chained associations in behavioral shaping, constitute the infrastructure of behaviorism. These can also be referred to as a foundational system in which all that is specific, objective, observable, measurable is to be dealt with by the agent. A typical application based on such a perspective is programmed instruction. In this form of teaching, in which the learning materials are organized and presented from simply-to-complicated and from easy-to-difficult. Learning tasks are further differentiated into smaller and smaller units and then gradually progressing toward more complex ones. Such a behaviorist approach is believed to be most effective for beginners' needs. Application of such an approach can be done by organizing the translation teaching material from simple-to-complex in terms of its level of difficulty. To take the syntax of source language as an example, learners can be given tasks starting from translating single word, phrases, sentences, and lastly from entire discourses.

The cognitive approach mainly deals with those cognitive processes involved in learning, inclusive of induction, deduction, rule finding, and law discovering, among others. Unlike behaviorism, the cognitive approach has to do with schemata development (rather than with mere knowledge accumulation or collection), and the attainment of understanding is of prime importance in the course of discovery. Ausubel's theory is concerned with how individuals learn large amounts of meaningful material from verbal/textual presentations in a school setting (seen in contrast to those theories developed within the context of laboratory experiments). According to Ausubel(1963), learning is based upon the kinds of super-ordinate, representational, and combinatorial processes that occur naturally during the student's reception of information. Meaningful learning, according to Ausubel, is that which exists when learners are able to subsume new material that is related to relevant ideas in the existing cognitive structure on a substantive, non-verbatim basis, and which further corresponds to the schemata development taking place. In translation where complex cognitive activities are involved, establishing schemata involved in translation, say, English sentential levels, is essential. For example, when dealing with clausal structures in English syntax, learners can be instructed to induce the rules underlying nominal, adjectival, and adverbial clauses; that is, rules for translation of different clauses from English-to-Chinese can be induced by

translation learners when led by the translation teacher. (Note: there is a correspondence word order between English and Mandarin in nominal and adverbial clauses, but that is not to be found in adjectival clauses).

Social constructivism stresses the importance of social context in understanding and constructing that knowledge which is based upon this understanding. Thus, to know the premises that underlie the target material is fundamental for appropriately effective translation to take place. One influential approach in translation teaching is found in Vygotsky's (1978) social constructivist perspective. This approach contends that students may develop their advanced cognitive competence and become more creative through social interactions that are scaffolded on the basis of learners' zone of proximal development (ZPD). In translation teaching practices, teachers may create a scenario whereby students follow the working example with the detailed processes involved in finalizing a translation task, or by allowing students of different levels to take part in an interactive discussion based on the scaffolding principle itself.

Humanistic learning, as distinct from behaviorism, cognitivism, and social constructivism, mainly focuses on individual learners' psychological needs and values, as well as on concomitant self-confidence and self-awareness issues. The humanistic approach is not concerned with how, or with what, one learns in the instructional settings, but about why one learns, thus it is more relevant to motivation of learning. Maslow's (1943)^[9] hierarchy of needs model, and Rogers' (1959)^[10] student-centered mode of thinking model as well as Rogers' Self Theory provide a firm basis for exploring humanism within a translating context. The jigsaw method, or collaborative/cooperative learning, takes individual needs, competencies, and other Self-related attributes into account which reflects the principles of humanism. A humanistic perspective of learning, like that of behavioristic and cognitive/constructive approaches, is indispensable in the course of translation instruction, since Bloom's (1956)^[11] taxonomy of instructional objectives, individual needs, values, motivations has much to do with the affective domain (the other two being cognitive domain and psycho-motor domain). As agreed upon by many educators, the key factor determining the lasting effect of learning often lies within the level of individual motivation and the affective aspect of learning, which is especially true in light of translation learning. Teachers of translation may help learners become more strongly motivated by rendering unto them unconditional regard, genuineness, and empathetic understanding during the course of collective translation instruction.

These ingredients are interdependent on one another and there can be no cutoff lines among them; the ingredient of one method, on the basis of one school of thought, may also involve other ingredients from other schools of thought; in any given instruction approach, there may be behavioral, cognitive, social constructive, and humanistic ingredients, but they are found in different proportions as the levels of learners may yet vary. For example, the cognitive ingredient in Vygotsky's social-constructivist approach may also involve behavioral ingredient (as scaffolding may involve step-by-step, or simplified adaptation of material), and humanistic ingredients (as learners' advanced cognitive competency increases, their self-confidence, self-awareness, or self-concept

also grows proportionally speaking). Thus, instead of treating the three ingredients as independent entities, the present model conceives the four ingredients to be as one; that is, effective instruction can be made possible only when these mutually interdependent ingredients are simultaneously taken into account during translation instruction. In the following, the ingredients in each component (three-pair of components) will be specified singularly.

The ingredients in Objective-Assessment

Taken from Bloom's learning objectives, there are roughly three domains: cognitive, affective, and psycho-motor. These three domains can, to some extent, be reflective of, or corresponding with, ingredients found in behaviorism (psycho-motor domain), cognitivism (cognitive domain), humanism (affective domain), and social constructivism (an integration of all). The field of psychology cannot be complete if any one of the approaches (behaviorism, cognitivism, social constructivism, and humanism) is left unemployed, underdeveloped, or isolated. Likewise, the learning objectives will be seen as incomplete if one of the cognitive, affective, and psycho-motor domains is left unattended to.

It is noteworthy that the inclusion of the three domains is not the sheer extension of learning objectives, but the integration and consolidation of what is to be learnt. In other words, learning results can be intensified through the mutual support to be had among the three domains; students' cognitive aspect of learning can be reinforced by their positive affects toward learning; and, application of what is learned cognitively may also reinforce and induce positive feeling (affect), which will propel further learning. In translation teaching, the goal of translation teaching is to facilitate the acquisition of communicative translational competence, which can be defined as the "ability to interact appropriately and adequately as an active participant in communicative translation tasks" (Kiraly, 1990: 215). Communicative translation competence can also be further classified into translational knowledge competence, translational knowledge structures, translational strategic competence, and the context of translational task (Colina, 2003: 27). Note that this communicative translational competence must simultaneously involve cognitive, affective, and psycho-motor domains (though in different proportions) to be considered as complete. The translational knowledge competence and translational knowledge structures can be regarded as mainly cognitive, translational strategic competence can be regarded as mainly psychomotor, and the social context of the translation task seen as mainly affective in nature. Furthermore, there are sub-categories in each of these three domains which are the criteria for all functioning of the other components (assessment, teacher, student, material, and method).

Firstly, for the cognitive domain, Anderson and Krathwohl(2001) modified Bloom's original model and proposed six sub-categories of cognitive domain (from simple-to-complex in the hierarchy below): remembering, understanding, applying, analyzing, evaluating, and creating. There is hierarchical nature to be observed among these sub-categories, notably that of students' creativity as the ultimate objective of instruction within the cognitive domain. It is especially true, when, and if, translation teaching is to

help student translators to be creative as professional translators. But, in order to help students reach such a goal state, the translation teacher must lead students through the stages of remembering, understanding, applying, analyzing and evaluating what is to be learnt on the basis of lectures specific to translation-related topics, through the provision of parallel texts, to giving ample opportunities to exert analytic capacity (e.g., pragmatic analysis on both source and target texts), and to promoting creativity that is always rooted from one's evaluative capability. From the sub-category hierarchy, the element of cognitivism (understanding, and analyzing), behaviorism (remembering and applying), and social constructivism as well as humanism (evaluating and creating) may also be discernible. Obviously, there are dynamic relationships that exist in at least three of the domains, and within the sub-category of each domain itself.

The affective domain is more concerned with values, or more precisely perhaps with perception of those value issues entirely within the social context (as related to humanistic element). This domain plays a key role in motivation, yet it is often ignored by cognitively- or behaviorally-oriented instruction. It is held that positive affective states will emerge if learners get to know more, and in more depth, the cognitive domain. Likewise, it is true if translation students can be given opportunities to act out what they learn in the psychomotor domain (application of translation skills or strategies). Again, it is possible to see the mutual interdependence existing among these three domains. The affective domain also manifests several subcategories: receiving, responding, valuing, organizing and conceptualizing, characterizing by value or value concept (Kratwohl, Bloom & Masia, 1964). Students will have to display their willingness to learn by receiving, before they can do the responding, and then learning can gradually become part of students' value system on the basis of value organization and conceptualization (this can always be accomplished through social or group processes).

Psycho-motor domain is the last domain of the noted learning objectives, the simplest of which was suggested by Dave(1975) that essentially draws attention to the fundamental role of imitation in skill acquisition. This domain also plays a key role in both motivation and knowledge acquisition in that students can refresh what they have just learned by applying it to daily life situations, thus consolidating what is already to be learned. The psycho-motor domain cannot be excluded in pursuit of learning objectives, for it serves multiple purposes. First, the cognitive aspect cannot be fully consolidated or actualized without exercising the psycho-motor aspect (translation skills and strategies application is especially important in translation teaching). One learns best through doing (the essence of Bruner's kinesthetic representation). Second, through application or implementation of what is learned, one may further realize the procedural knowledge that cannot be specified simply through language. Third, by the same logic, one can always benefit from multiple encodings (e.g., visual, aural, kinesthetic, olfactory, or tactile processing) and acquire what is being learned more fully, which will naturally enhance one's affective states, and thus prompt advanced learning to take place. The psycho-motor domain, like cognitive and affective domains, also manifests subcategories: imitation, manipulation, precision, articulation, to naturalization (Dave, 1975). It should be noted that imitation in the psycho-motor domain can best be executed through an

application of behaviorist principles (step-by-step, from the simplest to the most difficult, as manifested by the scaffolding process). Manipulation and precision may refer to the learners' active trial and error process, while naturalization refers to mastery of the psycho-motor skills, with a series of automatic response chains without conscious effort involved. In translation instruction, only when student translators reach a level of naturalization in their translation skills and strategies application can they then display creativity, the ultimate stage of the cognitive domain. In sum, we may find a state of mutual interdependence taking place in these three domains and the correspondence in the sub-category (though not on the one-to-one basis) existing.

As indicated earlier, assessment goes hand-in-hand with the objective, with assessment widely regarded as contributive to learning if it is properly administered and handled. According to the Triarchial Translation Instruction Model, assessment can be considered to be complete when cognitive, affective, and psycho-motor ingredients are ultimately included. As mentioned in the objectives, what is encompassed in the communicative translation competence must also be included in the assessment stage; that is, translational knowledge competence, translational knowledge structures (cognitive domain), translational strategic competence (psychomotor domain), and social context of the translation task (affective domain) must be evaluated in the process of assessment. Translation tests as well as criteria devised must include assessment of the stated sub-competences. As Bachman(1990) proposes, the componential scoring criteria should be used for testing multi-componential skills (i.e., componential scoring criteria are those in which each sub-competence is given a separate score). To specify, one score, for instance, would be given for each of the components of translational language competence, another for translational knowledge structures, another for translation strategic competence, and the final grade will be the sum total of adding the partial scores for each of the categories (Cao, 1996). On the other hand, both product-based and process-based testing should be well balanced in a way that, as Colina(2003) suggests, process-oriented materials should be predominant in a training program (versus product-based in an internship or in a certification context), even more so given the dominant product-based approach of traditional translation pedagogy. In short, assessment must simultaneously cover behavioral, cognitive, social constructive and humanistic aspects of the communicative translation competence to be wholly effective.

For the cognitive ingredients, as indicated in the cognitive domain (remembering, understanding, application, analysis, evaluation, and creativity), assessment for each of the sub-categories can be conducted through use of the so-called Taxonomy Table^[12], in which the items are produced on the basis of both the combined objective and the content (the final translation product can be used to assess the creativity in cognitive domain). Assessment on affective domain shall also be conducted to make assessment complete, which can be done by affective scales related to learning in general and the sub-categories, such as receiving, responding, valuing, organizing and conceptualizing, to characterizing by value or value concept in specific. This state will be reflected in the social contexts of translation teaching so that learners' attitudes, self confidence, self awareness, and other self related attributes toward each element in the translation

teaching settings may be reflected. The assessment of the psycho-motor domain may include the evaluation of ST processing skills (e.g., recognizing intertextuality, locating situationality, inferring intentionality, and so on), transfer skills, and IT processing skills (Hatim & Mason, 1997). Again the assessment of this domain will have to take into account various sub-categories such as imitation, manipulation, precision, and articulation; with naturalization being especially important in the last stage. (See Colina, 2003: 133 for the examples of componential grading criteria for the communicative translation classroom). Assessment of these three domains can be incorporated into the individual student translator's portfolio, which covers all that happens in the course of translation instruction (i.e., all the constructive processes involved in learning are recorded and organized, inclusive of reflections of learning events from the perspective of the learners themselves, from their peers, and from the teachers).

The ingredients in Teacher-Student

In a given translation instruction setting, teachers may assume the traditional role of being a class leader or director, lecturer, discussion leader, and / or assume the contemporary new role as instructional designer, trainer, collaborator, team coordinator, advisor, or evaluator (McGhee & Kozma, 2001). The Norwegian psychologist Ivar Bjørngen (1991) proposed four different teacher roles that may be followed: "the sculptor", "the entertainer", "the coach", and "the manager". From the perspective of the Triarchial Translation Instruction Model, different translation teacher roles may be integrated in terms of their behavioral, cognitive, social constructive and humanistic ingredients. Behavioral roles may be assigned to cover directors, trainers, instructional designers, managers, and sculptors. Cognitive roles will be assigned to include lecturers, coaches, collaborators, discussion leaders, and team coordinators. Humanistic roles will be assigned because they have to do with advisors, evaluators, entertainers, and mentors. Finally, social constructive roles may be assigned with all the possible combinations presented. Note that there is no clear distinction made among these respective translation teacher roles; or, differently put, these assigned roles reflect different stages of instruction in translational instruction. In an ideal translation instructional setting, teachers are supposed to play all of the teacher roles mentioned above with different proportionalities present according to the given classroom situations. As John Amos Komensky (1592-1679) put it succinctly: Teaching ought to be sensual (behavioral), rational (cognitive) and spiritual (humanistic) in nature.

For the convenience of introduction in this paper, the titles of directors, facilitators, and stimulators will be used to represent the respective behavioral, cognitive, and humanistic teacher roles, respectively. Translation teachers serving in their role as directors would be in charge of designing instructional materials, outlining specific instructional procedures or steps to be taken, implementing curriculum or materials, and specifying the means of feedback arrangement (reinforcement schemes). Next, translation facilitators may do things such as giving lecturers (i.e., the translation teacher is seen as a repository of knowledge/truth), coaching students (as in the scaffolding of Lev Vygotsky's social constructivism approach), collaborating with learners (as in constructivism), leading

discussions, and coordinating the expected team work. In other words, translation teachers may become resourceful persons who provide the adequate resources, know how to guide and direct translational interaction in the classroom, create the right conditions for developing the social aspects of translation, and foster translation as a communicative activity useful for acquiring translational skills and allowing students to learn in the most efficient way (Colina, 2003: 53). Lastly, teachers as stimulators are supposed to entertain students, give advice, conduct evaluations, and offer their inspirational spirit as mentors (i.e., the translation teacher is seen as developers of student translators' self concept necessary for becoming professional.) In sum, classroom translation instruction should be mainly student-centered, and then become teacher-guided. As Colina puts it, student discussion is the basis of instruction (with the exception perhaps of brief lectures), and the translation teacher may act as another participants in the interaction. That is to say, the translation teacher moderates and serves to resolve conflicts in the translational tasks at hand; he/she observes the process, guides the discussion, and provides an example of expert behavior in the overall translation process. The various roles the translation teacher plays in the instructional setting depend on the conditions of the other five components (i.e., objective, assessment, student, material and method) as well as being dependent on the relative weights of each of the ingredients correspondent to learners' levels of readiness. For instance, for the objectives in the cognitive domain, translation teachers are suggested to start from applying principles of behaviorism to deal with what is most basic (e.g., giving lectures with regard to translation, imparting basic translational knowledge, and instilling what must be remembered for translation), in which case teachers act mainly as directors. Next, when moving to the principles found in cognitivism/ constructivism (e.g., Bruner's discovery learning or scaffolding in Vygotsky's social constructivist approach on source and target texts analyses) to deal with what is related to understanding and application, in which case teachers will act as facilitators. Lastly, when dealing with what is further up (more advanced subcategories), teachers will act as stimulators.

In consideration of the cognitive domains, teachers need to consider all the components involved in the entire instructional settings, work out the optimal arrangement or organization of them, and play the simultaneous roles of director, facilitator, and stimulator, with more weight on facilitation. For the affective domain, what a teacher should do is, according to the Triarchial Translation Instruction Model, to act in the role of stimulator by taking into considerations learners' individual differences, their individual needs, or their self identity concept. This can be successfully done through individualized instruction, or by acting as a facilitator in order to create a cooperative or collaborative learning environment (e.g., open classrooms or various Jigsaws^[13]) in which students may interact with people of various or diversified backgrounds (this is also what social constructivists suggest). This will not only promote a sense of positive affect (e.g., self-confidence, self-awareness), but also contribute to an enhancement of both the cognitive and psycho-motor domains. For the psycho-motor domain, the translation teacher may act as a director by designing group activities in which all of the learners may straightforwardly follow instructions and simply to do as

they are told. In sum, teaching is considered by most to be an art, and there are a variety of instructional alternatives available to teachers that will help learners reach their optimal results. This will be a given if all the components involved in the instruction can first be coordinated and organized, and then the respective teacher roles may be allowed to shift in between those of being directors, facilitators, and stimulators as the learning conditions vary.

As to the student component, what a student translator should do in a given instruction setting also depends on the conditions of the other components (i.e., objective, assessment, teacher, materials and methodology). First, as teachers may be directors, so may the students be actors. Students will be allowed to display or act out their uniqueness and individual needs, which may include intelligence, motivation, aspiration, values, learning styles, learning strategies, temperaments, personalities, self concept, or even the writing styles as reflected in their translation styles, among others. Next, students shall also be explorers as teachers are facilitators. This can best be demonstrated in meaningful learning where teachers offer students the necessary learning materials (e.g., source and target texts analysis, or parallel texts) or relevant information necessary to facilitate the students' establishing schema (e.g., the best translation decisions or solutions to translation tasks). Lastly, students can also be creators whenever the teachers act as stimulators. We can see the behavioral, cognitive, and humanistic ingredients in students' becoming actors, explorers, and creators, respectively (note: social constructive ingredient here is the combination of all). In view of the cognitive domain in objective component, the students' initial knowledge (or background knowledge related to both source and target texts) in relation to what is to be learned (informational gap when dealing simultaneously with two texts taken from different cultures) should be activated, explored, and then created. For this, learners can be provided with advanced organizers (Ausubel, 1978) of the translation material, with which students' previous relevant translation knowledge and knowledge structure can be integrated, because the combination of what is already learned with what is yet to be learned is the key to effective learning. Such a principle can be applied to all the three objective domains.

For the affective domain, as mentioned earlier, students' affective aspects are interdependent on cognitive and psychomotor aspects, with mutual reference of one to another. That is, students' roles as actors, explorers, and creators are inter-dependent, and interchangeable during the course of learning. To specify, students' roles are active; students are supposed to learn by interacting with the materials provided, the participants present, and the learning context surrounding them. Quite distinct from that of other courses, translation teaching aims to help student translators become professional, and translation education cannot be completed without social interactions with other translators in a given sense of community. Today the explosion of the Internet, online services, the World Wide Web, and virtual space offer access to the social domain aspect of the translation profession within the reach of learners and instructors (e.g., subscription lists, discussion groups, and newsgroups are examples of virtual communities)(Colina, 2003: 55).

Likewise the students' respective roles as actors, explorers, and creators can manifest

within the psycho-motor domain. Student translators are prone to acting or are developed to have the disposition of imitation, especially toward things they like (as actors would). Organizing various activities such as classroom discussions, e-mail correspondences, online discussions, among other translational activities can be very constructive and thus indispensable to the process of translation instruction. During the course of social interactions within and across various discussions, student translators' translation competence (e.g., skills and strategies) can be refined and polished through the scaffolding processes that naturally come about through group discussions. Further, as Colina(2003) indicates, peer feedback can also be obtained by having students comment on and read from each other's translation work. Translated texts are then returned to the students with instructor feedback to further revise and then place into the student's individual translation portfolios.

The ingredients in Material-Method

The design of teaching materials should also encompass the cognitive domain (elements of cognitivism), affective domain (elements of humanism), and psycho-motor domain (elements of behaviorism). For acquisition to take place, first of all, student translators have to be exposed to "acquisition-rich" input within the course of their classes, and this input must contain a multi-varied range of communicative situations, a monitoring agent, tasks of various significance, incentives to focus on particular aspects of the task cycle versus others, varied and frequent feedback, and indications of a professional translator's goals and expectations (Colina, 2003: 30). Further, the student translators need to see textual markers necessary for processing the raw data that are taken from the input as relevant features for their translation assignment. This intake can be further used to reconstruct their translational structures to help "interpret appropriately and adequately as an active participant in communicative translation tasks" (Kiraly, 1990: 215), as well as to acquire "a set of schemata for remapping across culturally bound form-function sets" (Shreve, 1997: 130). In other words, the materials used as the input (subsequently to be referred to as "intake") is used to restructure translational knowledge structures and thus create a developmental system from which production of translated texts that respond to the specifications of the assignment can then be created. From a cognitive perspective, acquisition-rich materials (e.g., specifications of a varied range of communicative situations along with parallel texts or working examples) should also be presented in classroom from the very beginning of instruction to facilitate activating learners' older experiences (or developing necessary schema). Scaffolding is essential where learners of various levels of readiness may receive contingent supports according to the level of tasks, incentives, feedback, and indications of goals and expectations to be had. Note, whenever presenting translation instruction materials, the main texts should be presented from simple-to-complex, from easy-to-difficult, and from concrete-to-abstract. Also, the exercise problems (preferably taken from real life translation problems) should be included in the materials, and it must also follow the above mentioned organizing principles. Preferably, the materials to be presented in teaching are also those to be used in translation assessment, which may further enhance students' overall motivation (i.e., to

facilitate backwash effect). In addition, teaching material should be replete with translation tasks that require an application of what is already learned, so that the evaluation and creativity may be reflected from individual performance based on these tasks. As to Affective domain, teaching materials may include texts of various genres as well as those with salient cultural connotations (literature, prose, short stories besides the materials for instrumental translation). Moreover, the materials adopted may facilitate group processions, discussions, or social interactions, which will help strengthen and develop student translators' self-awareness, and self concept. Lastly, as to the psychomotor domain, group activities with reference to the application of translation strategies should also be included. These may serve to consolidate what has already been learned in the cognitive or affective domains. In sum, development of the translation teaching material, as under the framework of the present model, must include those texts which activate behavioral (psychomotor), cognitive (schema building), and humanistic (affective or social constructive) elements, all at the same time, but in different proportionality since learners' levels of readiness may vary (to be elaborated upon later).

On translation teaching methods, the universal rule for effective instruction is to help students combine what they already know with what they do not currently know, which as a rule actually applies to cognitivism. This also applies to social constructivism as well, or even to behaviorism and humanism, but with significantly different implications. From a cognitive perspective, teaching methodologies must be implemented on the basis of the universal rule mentioned above. Scaffolding involved in social processes, group procedures, and discussions helps students to transfer or apply what they have already learned to what they are about to learn. In scaffolding, teachers clarify the new concepts students will be exploring, identify what students have already learned, and establish the connection between the two (e.g., concept mapping^[14]). Thus, teachers must know what students have already learned about the subject that is being taught with a view to teaching it effectively and without duplication. Teachers may start from giving a series of mini-lectures (not to exceed 15 minutes) to be presented just after the beginning of instruction (some possible lecture topics may include: the nature of professional communicative translation versus other types of translation --interlineal, grammar translation-- common misconceptions and myths dealing with translation and translators)(Labrum, 1991). Further, the translation teaching method must focus on the translation process as a series of stages to take place (research, analysis, translation, revision) reflected in the pre-translation, translation, and post-translation activities of translation tasks (Colina, 2003: 65). From a behavioral perspective (or psycho-motor domain), translation skills or strategies to be taught and their corresponding teaching methodologies must be made specific and clear to students from the onset. For example, if the notion of communicative translation is to be the target of teaching, then the teacher must provide translation tasks with various communicative requirements as well as acquisition-rich input, and offer a range of communicative situations; if pragmatic factors are to be the target, then teachers must adopt guided activities, and provide acquisition-rich input, and help focus on relevant data, and cues; and, if the ability to isolate translation problems is the target area to be taught, then the translation teacher must use

revision component, and activities to raise awareness (Colina, 2003: 31). From a humanist perspective, cooperative learning refers to the instructional arrangement of small task groups so that learners may work together to maximize learning results. In cooperative learning situations, learners are placed into non-competitive situations, where every single individual is given the opportunity to succeed in consideration between individual needs and differences and those of others; their face-to-face interaction can be promoted to refine social skills, and through group processing, a positive interdependence among learners goal attainments can be realized by all the group members – therefore, every student may sense that he can accomplish his learning objectives on conditions that other students in the learning group can also reach theirs. All these considerations may somehow manage to stimulate learners' intrinsic motivation for further learning, and more importantly, allow student translators' self concept, self awareness, and self confidence to be greatly enhanced to the extent required as professional translators. As Kiraly (2003) put it, the primary goals of translator education will include raising students' awareness of the factors involved in translation, helping them develop their own translator's self-concept, and assisting them in the collaborative construction of individually tailored tools that will allow translation students to function within the language mediation community shortly after graduation. There exists empirical evidence in favor of a socialization component of translation teaching. As indicated by Kussmaul (1995), studies have shown that when compared to professionals, students of translation lack both self-awareness and self-confidence, which can be attained through an increased awareness of their professional environment and by placing students in situations where they can start the socialization process with others in the field of translation work. It is essential for teachers to organize social situations and create authentic communicative translation tasks for students to facilitate their acquisition of communicative translation competence in the classroom.

To reach the desired optimal translation teaching effect, a teacher must take into account three objectives (cognitive, affective, and psychomotor domains) as well as their corresponding approaches or ingredients (cognitive, social constructive, humanistic, and behavioral). To take the aspect of creativity (the last item in cognitive objectives) as an example, the translation teacher may help students reach such a goal state through the use of brainstorming, relaxed or informal discussion atmosphere, or discussions to take place in the target language (Colina, 2003: 79-80). It is argued that these methods must be comprehensive enough to include cognitive, social constructive, humanistic, and behavioral ingredients. Firstly, brainstorming is a common technique frequently used to activate appropriate schemata in reading comprehension. This technique provides rich information the translation teacher can use in order to bridge the gap between learners' current knowledge (schemata) and the intended goals (i.e., restructured schemata; restructuring of knowledge structures, as initiated by Shreve, 1997). This technique, even when implemented alone, may meet the cognitive, behavioral, and humanistic ingredients simultaneously. As the name implies, brain storming activity seeks to trigger as many non-judgmental ideas as possible for a certain translation topic, or task (cognitive and social constructive by nature). After the list of all the possible ideas, teachers will initiate

a discussion based on the ideas presented and work to organize and select those adequate ideas for translation solutions. This is humanistic- and social constructive-oriented because such a procedure helps to foster expert behavior, and generate self-confidence, as well as self-awareness. The subsequent sense of personal relaxation caused by the brainstorming activity is useful for training fluency, a desired condition for the production of translation solutions. Second, the relaxed, informal discussion atmosphere of brainstorming helps to lower affective filters which may inhibit teamwork, feedback production, and reception (Shreve, 1997: 133). With constant feedback from both peers and teachers (as monitoring agents), students' acquisition of translational competence is thus made possible. Next, for the discussions to take place in the target language, Colina(2003) contends that discussing translation solutions in the target language (translation from L2 to L1) is also a valuable technique for the encouragement of paraphrasing and for making students aware of its value as part of the translation process, which will obviously reflect the principle of scaffolding adopted as part of the social constructivist approach.

Levels of readiness in relation to the components

In the Triarchial Translation Instructional Model, there are three major components (three pairs) to be found in the instructional loop (objective-assessment, teacher-student, and material-methodology), and form ingredients within each component (behavioral, cognitive, social constructive and humanistic). One extra component involves the consideration of learners' levels of readiness: the rudimentary ability to mediate (beginner), the mediation ability of language learners (intermediate), and the mediation ability of professional translators (advanced) (Lorscher, 1997). There are multiple dynamic relationships among the trinities taking place.

The first of the three components, teacher-student, objective-assessment and material-method must be treated interdependently in order that objectives should be established by taking into account learners' individual differences, as well as their levels of readiness. The materials used to reach these objectives must also be considered in relation to student variables as given. Assessment must be carried out on the basis of objective specifications, and what the translation teacher does must follow the tract of translation assessment as well as the translation methodology that matches the translation objectives. In short, implementing each single component will have to simultaneously take into consideration the other two components.

Second, the relationship observable among behavioral, cognitive, social constructive and humanistic ingredients in each component can be considered as mutually embedded, with each inclusive of one another yet found in different proportions as conditions vary. Specifically, what is cognitive may also encompass what is behavioral, social constructive and humanistic. Likewise, so are the humanistic, social constructive and behavioral encompassing of the other ingredients. For example, translation tasks (materials) arranged and organized from simple-to-complex and from easy-to-difficult, as in programmed instruction, is apparently behavioral in nature, but it can also be humanistic and social constructive in that such a translation material design looks

decidedly learner-friendly. Thus, it can better help learners to achieve initial success which is useful in arousing learners' positive affects. On the other hand, when translation tasks (materials) are so organized (as in the case of programmed instruction) through the process of successive approximation allows for learners to gradually grasp the hidden rules or principles, which is what neo-behaviorists (e.g., Tolman's(1922)^[15] idea of cognitive map) have always contended. The differences do not follow an all-or-none phenomenon scheme (what is learned is either behavioral, cognitive, social constructive or humanistic approach), but operate along a continuum in which different levels of each ingredient may lie. To specify, the translation activities can be organized in a way that various translation competence components will be emphasized differently according to the requirements imposed by the text taken under consideration as well as by the learners' personal levels of readiness. For example, beginners will have to spend more time on a set of pre-translation activities designed for consideration of pragmatic factors for the ST (source text) and TT (target text), a translation brief (complete or partial), transfer issues (i.e., "How do the pragmatic factors studied relate to the transfer process?" "What are the consequences for textual features and organization and the parallel text analysis?"). That is, teaching about translation-relevant processes, such as comprehension, bottom-up and top-down processes, and meaning potential realized in texts, and techniques of analysis (e.g., textual and pragmatic analysis) should be the first priority for beginners (Colina, 2003: 34-36). In a word, these activities must be conducted in accordance with learners' levels of competency and also by taking the ingredients (cognitive, behavioral, social constructive and humanistic) into account, as found in the reading comprehension sections given for translation teaching. Reading comprehension sections help make up for difficulties in comprehension, incomplete schemas, unclear terminology, which contribute to the overall understanding of reading and its role in translation, as well as to the translation process. By the same token, translation instructional activities focusing on language sections for translation, language use, and linguistic problems (e.g., negative transfer, sign translation, translation difficulties, and linguistic issues) must be organized according to the learners' levels of readiness in consideration of all the ingredients as provided. As to the post-translation activities, more emphasis on the application of the concepts/skills acquired through the translation of the text and guided activities to issues beyond a particular translation task should be placed in consideration and benefit of advanced learners. In short, for different levels of learners, the emphasis placed on pre-translation activities, provision of reading sections, focus on language, and conduct of post-translation activities must be made in different proportions, and with a greater proportion of the latter activities activated due to learners' levels of advancement.

Brief review for practical applications of the model

As introduced in the previous sections, this translation model features an inter-dependence among three pairs of components (objective-assessment, teacher-student, material-methodology), three ingredients (behavioral, cognitive, humanistic), and the learners' state of readiness (beginner, intermediate, advanced). So, as a result in actual instructional settings, the inter-dependence involved must be taken into full account. This

is true since this model seeks to provide an instructional framework, for example, for a two-year durational translation program in an undergraduate curriculum setting, the objective, the overall assessment, the teacher, the student(s), the instructional materials, and the methodology which shall be set accordingly and be specified as follows:

Firstly, regarding the objective, the emphasis of instruction will be placed on practical translation from L2 to L1 in vocabulary, phrases, and sentences during the first year, while in the second year of the program, in paragraphs, discourses, and genres. Note that the translation of paragraphs will also be included in the first year program but in a relatively less proportionality, as well as sentences to be included in the second year to secure the instructional continuity of the program. Further, the objectives of the translation program for both years may encompass applying translation skills, as in the behavioral domain; exploring principles or schemas, as in cognitive domain; and, demonstrating positive attitudes toward learning tasks, as in humanistic domain.

Secondly, regarding assessment, traditional tools of assessment, such as paper-pencil tests (e.g., blank filling, matching, multiple choice, comparison, and essays), questionnaires/inventories, or evaluation sheet (self and peer), can all be applied; that is, both quantitative and qualitative assessment are to be employed. Note also that the items in the objectives shall also be the same as those for assessment; that is, both objectives and assessment must be made as to be mutually consistent and relevant. Specifically, blank-filling, matching, and multiple choice formats used in paper-pencil tests are quantitative measures of translation skills, comparison and essay tests for the comprehension of principles or schemas, while questionnaires/inventories are used for measurement of student translators' affects/attitudes. As to process and product assessment, it is suggested, according to the model, more process-orientated assessment should be applied in the first year program to facilitate the teacher's understanding of students' problems with embracing the translation process, and at the same time to reduce the pressure of learning, which is done out of humanistic concern for the students' welfare and continued progress.

Regarding teachers, a preliminary training on instructional psychology where behaviorism, cognitivism, social constructivism, and humanism are all included is essential. As mentioned earlier, the varied roles of the teacher play are flexible in that when introducing translation skills in lectures, the teacher plays the role of a director; when organizing a situation where students may explore and establish translation principles or schema, the teacher plays the role as a facilitator; and, when promoting students' motivation of learning and translation creativity, the teacher is a stimulator. For beginners, both the director and stimulator roles played by the teacher are quite important and thus should be dominant because beginners will be perceived to need specific direction and are deemed more vulnerable to frustrations, requiring both directors and stimulators at the same time. For intermediate-level and advanced-level learners, the teacher's facilitating and stimulating roles are ever more important. Note again that there is no fixed proportion in terms of the three roles the teacher plays, and that the roles will change flexibly as situations may vary or warrant.

Next, regarding students, the roles of the students play are directly subject to the

teacher roles. That is, when the teacher is introducing translation skills in lectures as directors, the students will play the role of “actors”—acting out what the teacher has taught; when the teacher is organizing a situation for students to explore and establish translation principles or schema, the students are “explorers”, and, when the teacher plays the role of a stimulator, the students can either be motivated to go ahead on their own individually, or to create their own positive self-concept or values about the translation process. There seems to be a contingency in students’ readiness level and the roles they play. For beginners, it is the acting out of what the teacher directs that is of importance (i.e., be more attentive in basic rules or skills of translation); so are intermediate-level students who are made to play the role of explorers more apt to place importance on directions (i.e., use of inductive and deductive abilities to explore the translation principles on the basis of what has been already learned); and, advanced learners are encouraged to play the creative roles more (i.e., create positive attitudes as well as creating translation competence).

Then, regarding translation material, this may encompass variable content taken from different levels of input ranging from individual words, phrases, sentences, paragraphs, discourses, to entire genres. In the first year, words, phrases (inclusive of collocations, slang, idioms) and sentences are to be set as the focus; while paragraphs, discourses, and genres form the focus for the second. The level of words and phrases are to include parts of speech, their proper combinations, and their transformation from L2 to L1. On the level of sentences, there are translation skills on sentences that consist of various clauses (namely, nominal, adjectival, and adverbial), as well as their transformation from L2 to L1, English to Mandarin in discussion-- please refer to the article “An English Chinese Translation Model on Syntactic Differences with its implications” (Guey & Lin, 2006), which must be mastered before going upward to levels of paragraph, discourse and genres. As to the paragraphs, discourses, and genres in the second year, cultural background information of L2 should be introduced first and then students may move up to different genre of texts such as technology, business, journalism, literary works, etc. Note that words, phrases, and sentences can also be embedded in texts of various genres, but it is suggested that the texts preferably relate to technology and business since these texts are relatively free of culture-specific markers, which may reduce the translation load for learners in their first year. Obviously, the material arrangement for the two-year translation program is consistent with the suggestions taken from the present model, in that the material is organized from easy-to-difficult, and from simple-to-complex (i.e. words are easier and simpler than phrases, than sentences, than paragraphs, while the discourse and genre are most difficult and complicated).

Lastly, regarding methodology, as mentioned earlier, translation methodology must correspond to translation material in coordination with students’ levels of immediate readiness. In the first year of a translation program, programmed instruction (behavioral orientated approach) can be applied to help learners to master basic skills for translation of words and phrases from L2 to L1. Since material for the first year will also include transformations of parts of speech from L2 to L1, the adoption of scaffolding, through the giving of working examples, can greatly reduce the cognitive load of having to establish

schema or principles with reference to transformation. When moving to learning on sentential levels, students may be encouraged to adopt contrastive analysis that may be coupled with deductive ability on three different L2 clauses to master translation skills on sentential transformation. As to the paragraph, discourse, and genre level in the second year, task-based instructional approaches with cooperative and collaborative learning can be adopted, especially when using the “jigsaw” method, as suggested earlier. The tasks involved in the second year program may involve comparisons or contrasts of translations made in different genres, or that of different translated versions of the article of a specific genre, and a translation class with learners present from all three levels of immediate readiness (beginner, intermediate, and advanced) may contribute to learning when before-task, during-task, and after-task activities are given appropriate weights for learners of different levels of immediate readiness. To specify, for beginning-level students, more weight-of-emphasis may be placed on pre-task activities (basic knowledge and skills); for intermediate-level students, more focus will be placed on during-task activities (problem solving by applying translation skills and knowledge); while more emphasis will be placed on post-task activities (reflection, evaluation and inspiration) for advanced-level learners.

Conclusion

This proposed instructional model seeks to integrate the relational ingredients within all the components found in the instructional settings, but it is not without its problems. First of all, it is hard to find a clear distinction among these ingredients, thus it is hard to be operationally defined. As mentioned earlier, each single ingredient may at the same time encompass the others; there is a cognitive ingredient embedded in a behavioral ingredient. Likewise, there is a humanistic ingredient embedded in both cognitive and behavioral ingredients. Second, it is theoretically challenging that methods derived from distinct theories are to be merged or concocted into a single model. For example, it may not be theoretically legitimate to give the initial application of programmed instruction (behaviorist approach), followed by meaningful learning (cognitive approach) since these two diverse approaches are rooted from two distinct, perhaps even divergent, theories. In the cognitive oriented approach, what is basic (as is the focus of behavioral method) can be simultaneously dealt with in the cognitive oriented approach per se. That is, most cognitive theorists believe that learners can indirectly master what is basic through a detailed comprehension of the underlying relationship of the elements of those basic concepts. Next, it is difficult to determine what predictions can be made about possible instructional outcomes according to the present model. We believe that, success or failure of translation instruction can be demonstrated by the dynamic relationships underlying components and ingredients located within each component in the Triarchial Translation Instruction Model. The effect of translation instruction can be predicted by the levels of coordination among the components as well as with the ingredients mentioned above. For instance, if the objective-assessment component is not specified in a given instructional setting, chances are that the learning effect will not be as desirable, simply because there is a loophole in the dynamic chains between the objective-assessment component and the other components. That is to say, to make instruction effective, each component shall be

taken into account and be made correspondent and coordinate with others in turn. Such logic also applies to the ingredients (behavioral, cognitive, social constructive and humanistic) within each component; the learning outcome can be maximized given that the three ingredients are simultaneously taken into account or properly handled in appropriate proportions according to learners' level of readiness as well as the dynamic relationships among other components. Note that the proposed model in this paper may serve as a framework for translation teaching, rather than as specific techniques or methods. However, the offering of specific steps in the course of teaching might be considered to be of great value to beginning translation instructors. Like other fields of instruction, how the instructors endeavor to go through the entire instructional process is really still an art, more than operational as some form of technique. Unlike other fields of discipline, translation teaching manifests multiple dimensions in various respects, thus unjustifiable of adopting any specific or singular teaching approach or technique. Though the proposed Translation Instruction Model is comprehensive enough in scale, as compared to other approaches, to encompass elements of many other models (or instructional approaches), it is still subject to continued empirical review at this time.

Notes

- [1] Programmed Instruction or Learning, as based on Skinner's operant conditioning, is as suggested from the Triarchial Instruction Model, an indispensable design for beginners.
- [2] Behaviorism originated with the work of an American psychologist, John B. Watson, and is today associated today with B.F. Skinner. It is one of the theories adopted by the Triarchial Instruction Model.
- [3] Scaffolding Learning, proposed by Soviet psychologist Lev Vygotsky, is an instructional technique whereby the teacher models the desired learning strategy or task, then gradually shifts responsibility to the students. It is an inquiry-based learning method, as assumed by the Triarchial Instruction Model, for intermediate learners.
- [4] Vygotsky(1970) proposed a theory called social constructivism. He suggests that social interaction plays a fundamental role in cognitive development. He also insists that the potential for cognitive development relies on the "zone of proximal development" (ZPD), which is a level of development attained when learners engage in social behavior, and the full ZPD development results from full social interaction. From the perspective of the Triarchial Instruction Model, Vygotsky's system features behavioral, cognitive, social constructive and humanistic ingredients, but with different proportions.
- [5] Open classroom refers to the instruction setting in which students are allowed to have more opportunity to explore the learning environment, and their social and emotional well-being is supported and nurtured in addition to academic growth and success. Such design is based on principles of humanism.
- [6] Humanism is concerned about humanity, and human individuals. Instructions based on humanism features the concerns of individual needs, values, self growth, self-respect, and self actualization. Like behaviorism, social constructivism and

cognitivism, humanism is the indispensable theory adopted by the Triarchial Instruction Model.

- [7] Classical conditioning is a theory initiated by Ivan Pavlov, a Russian physiologist during the early 20th century. It deals with learning that takes place through a direct connection of stimuli and response, and it is the original theory on which behavioral learning is now based.
- [8] Operant conditioning is a type of associative learning in which there is a contingency between the presentation of response and the reinforcer, elaborated by the classic experiments of Skinner(1938). Programmed instruction is mainly based on principles of operant conditioning.
- [9] One of Abraham Maslow's most distinguished works, which was exclusively based on principles of humanism, was his representational theory of a "pyramid" of human motivation characteristics; that is, the theory of a person's 'hierarchy of needs, from which all human behavior is derived. Maslow suggests that only when the most basic (physiological) needs are met that humans can seek to meet the needs found in the higher hierarchy levels. All of this is naturally emergent. His humanistic perspective is one of the necessary ingredients in the Triarchial Instruction Model.
- [10] Rogers' theory is based on humanism and applied in both counseling and instruction. Rogers sees mental health as the normal progression of life, and believes that all creatures strive to make the very best of their existence, if they can be given unconditional regards, genuineness, and empathy. The humanistic ingredient in Carl Rogers' system is indispensable in the Triarchial Instruction Model.
- [11] Bloom proposed three domains in learning objectives: cognitive, affective, and psycho-motor domains. Such a taxonomy reflects the combination of behaviorism, cognitivism, and humanism ingredients, and it serves to support the contentions made as part of the Triarchial Instruction Model.
- [12] The Taxonomy Table seen below is designed to help write clear, focused objectives. The Table has two dimensions: 1) The knowledge dimension, and 2) the cognitive process dimension. See the example below, as follows:

The Knowledge Dimension	The Cognitive Process Dimension					
	Remember	Understand	Apply	Analyze	Evaluate	Create
Factual						
Conceptual						
Procedural						
Meta-cognitive						

- [13] Jigsaw is, based on the principles of humanism, a cooperative learning strategy enabling each student of a "home" group to specialize in one aspect of a learning task. Students meet with members from other groups assigned the same aspect, and after having mastered the material, return to the "home" group and teach the mastered material to their other group members. The purpose of "Jigsaw" is to develop

teamwork and cooperative learning skills within all students. It facilitates not only cognitive and behavioral ingredients, but also humanistic ingredients.

[14] Concept mapping, a special form of a web diagram for exploring knowledge and gathering and sharing information, is used to help describe ideas about some topic in a pictorial form.

[15] Edward C. Tolman(1948), who initiated the theory of sign learning or cognitive map, is considered the bridge between behaviorism and cognitive theory. Tolman believed that an organism learns by pursuing signs to a goal, i.e., he focused on the organized aspect of learning. Tolman's version of behaviorism emphasized the relationships between stimuli (instead of stimulus-response association), which does not require reinforcement to produce learning effect. Tolman's ideas are useful to mediate those between behaviorism and cognitivism, which sheds lights on the Triarchial Instruction Mode.

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