

Utilization of Multiple Intelligences at the tertiary level for the Promotion of Active Learning

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Abstract

The term 'Global jenzai (Global Human Resources) has become a buzz word particularly within the field of tertiary education in Japan with the Ministry of Education presenting mandates that are aimed and hoped meet the challenges of producing future 'Global Citizens' (MEXT, 2014). One method often presented as a solution to the challenge of developing global jenzai is active learning with its concentration on learner autonomy. The promotion of active learning a great challenge to tertiary educators in Japan as it may be argued that two of the most highly denigrated aspects of Japanese education are its rigidity, and its focus on rote-memorization to the detriment of higher order thinking skills and are not conducive to active learning (Beauchamp, 2014). This paper discussed how active learning might be encouraged by applying quantitative data obtained from a Multiple Intelligences (MI) Inventory designed by the researcher led to the strategic implementation of MI principles into tertiary CLIL classes. Practical interventions such as the incorporation of the teaching strategies cooperative learning and the use of music for TOEIC preparation were presented and offered as a means to improve motivation, promote learner autonomy and met the criteria active learning. Further research was indicated to determine whether deep understanding or learning was established as this issue was found to be beyond the realm of this study. Future studies increasing sample size or adding a quantitative research instrument may offer more information as to the benefits of MI generated activities in this CLIL context.

Key words: Active learning, Multiple intelligences (MI), active learning, Content and Language Integrated Learning (CLIL), learner autonomy

1. Introduction

In the review current educational models in United States and United Kingdom there to have been a movement at the tertiary level to move instruction away from a high dependence on lecturing, and utilize educational methods that promote a greater degree of engagement of students (Tickle, 2014). This focus or need to engage students emerged as a result of the need for more hands-on, transferrable-to-future skills and talents as well as deep thinking (Smith, Sheppard, Johnson, & Johnson, 2005). In Japan, though MEXT initiatives a similar, trend has arisen and has been termed "*active learning*." (MEXT, 2014). The concept of Active

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Learning may be viewed as resulting from the MEXT Course of Study which mandates that for high school English classes, in principle, should be taught mainly in English leading presenting a further need to promote methodology to be more problem and task-based as well as feared toward a learner-centered approach (MEXT, 2011). These mandates present a clear challenge to educational reform as it may be argued that two of the most highly criticized aspects of Japanese educational system are its rigidity, and its focus on rote-memorization to the detriment of higher order thinking skills which are in direct opposition to active learning (Beauchamp, 2014).

Such learning success both in the areas of content as well as language has been found with Content and Language Integrated Learning (CLIL). As this methodology has been associated with utilizing a learner-centered approach, it would be beneficial to take this one step further and prior to implementing teaching methods and techniques within curriculums, investigate learners' individual needs as well as their preferred learning styles, and learning strategies in order to promote an optimum learning environment (Oxford, 2006). Research conducted by Gardner (1993) suggests that each individual has the opportunity to possess different types of intelligences termed Multiple Intelligences (MI) namely: linguistic intelligence, logical-mathematical intelligence, visual-spatial intelligence, bodily-kinesthetic intelligence, musical intelligence, interpersonal intelligence, intrapersonal, and naturalist intelligence (Armstrong, 2009). Although linguistic intelligence, logical-mathematical and to a lesser extent, visual-spatial intelligence, are most closely related to language acquisition, other intelligences may be significant for language learning (Lucietto, 2008).

Drawing from the results of a study (Yamauchi 2014) investigating the prevalence of various Multiple intelligences in Japanese tertiary CLIL classes this paper will discuss how applying quantitative data obtained from a Multiple Intelligences (MI) Inventory designed by the researcher led to the strategic implementation of MI principles into tertiary CLL classes. The Result being the development of more appropriate, student-centered teaching techniques within the current syllabi and the promotion of active learning. With identification of the prevalent intelligences found present in this student group the benefits as well as the ease in which MI techniques may be implemented into the CLIL classroom cumulating with the improvement of teaching practice and the inception as well as the promotion of active learning which will be previewed from the results of teacher observations and student exit interviews.

2. Literature Review

2.1 Active Learning

Historically In Japan there has been an over-reliance on teacher-centered lecture formats within tertiary education (Beauchamp, 2014). Although there may be merit in lecture format in instruction with this group the reality is that this methodology does not student-centered learning and the mere rote-memorization of salient facts does not promote deep learning, thus active learning will not be achieved. Active learning is best obtained when the content and scope of activities presented are based on student needs. Active learning insures that

students brains are not empty vessels, waiting to be filled with knowledge for the short term but that skills and are both understanding is better attained and better retained for the long term when students are deeply engaged in the learning process (Smith, *et al*, 2005). This concept would seem in opposition to the current model with students viewed as passive participants waiting to discharge memorized items for the next important test.

Active learning can be witnessed when students are actively engaged with the content of the course and with each other in ways that truly foster long-term acknowledgement of knowledge and use of critical thinking skills. Additionally, active learning is only achieved successfully when goals and outcomes of the course are known to students and thus become an integral part of the learning process. Active learning requires transparent, formative and summative assessment being.

2.2. Multiple Intelligences (MI)

English psychologist Charles Spearman in claimed in a research paper on general intelligence in 1904 that all forms of intellectual activity appear to originate from a unitary or general ability termed “g” factor for problem solving. During this period French psychologist Alfred Binet inaugurated the first intelligence (IQ) test. In the beginning, it was a 30-item intelligence test aimed at identifying primary school students in need of special education. Binet’s research crossed the Atlantic to the United States with Lewis Terman from Stanford University publishing an amended version in 1916 of Binet’s original test labeling it the Stanford-Binet Scale (Armstrong, 2009 and Shearer, 2012). Although Binet had developed his scale with the goal of predicting children’s school performance and not as a measure of intelligence across all endeavors, the results of his and Terman’s work were viewed as confirmation of Spearman’s ground breaking theory, which became the prevailing view of intelligence throughout the 20th century. Although widely accepted there were a few opponents to the concept of general intelligence remarking that the IQ test was a limiting instrument as it only appeared to measure only logic and language (Thurstone, 1938).

It was not until 1983 when the psychologist Dr. Howard Gardner presented an alternative hypothesis of intelligence, with his Theory of multiple intelligences which challenged the current held view of intelligence as an easily measured solitary isolated concept (Gardner 1993). A professor of psychology at Harvard University, Gardner (1993), introduced this theory as an alternative theory to the traditional notion of intelligence as a fixed entity based on IQ testing as he theorized that the concept may be too restrictive in scope (Christison, 2005). According to Gardner’s theory, intelligence may be defined as a bio psychological potential to process information in certain kinds of ways, in order to solve problems or create products that are valued in one or more cultural settings (Gardner, 1999). One of the most unique and outstanding features of MI theory is the concept that individuals can develop one or more talents or competences he termed intelligences (Armstrong, 2009). He initially proposed seven intelligences later adding an eight, a naturalist intelligence(see table 1) (Gardner, 2011). More

recently other intelligences such an existential intelligence (Chen, Moran and Gardner, 2009) has been proposed, but as Gardner believes more empirical evidence necessary prior to its inclusion.

Summary of Multiple Intelligences

Linguistic intelligence	Related to sensitivity to spoken and written language, additionally the ability to learn languages, and the capacity to use language to accomplish particular goals. This intelligence includes the ability to effectively use language for expression verbally or as a means to remember information (Christison, 2005).
Logical-mathematical intelligence	Involves the capability to analyze problems logically, or carry out mathematical operations utilizing deductive thinking, as well as the ability to conduct scientific investigations through logical reasoning(Gardner,1999).
Musical intelligence	Generally viewed as the skill in the performance, composition, and appreciation of musical patterns. It encompasses the capacity to recognize and compose musical pitches, tones, and rhythms. Musical intelligence is often viewed as structurally parallel and is often linked to linguistic intelligence (Armstrong,2009).
Bodily-kinesthetic intelligence	is largely concerned the potential of using one's whole body or parts of the body to solve problems but it may also be associated closely with the ability to use mental abilities to coordinate bodily movements(Gardner,1999).
Spatial intelligence	Incorporates the potential to recognize and use the patterns of wide space and more confined areas(Christison,2005).
Interpersonal intelligence	Is concerned with the capacity to understand the intentions, motivations and desires of other people. It allows people to work effectively with others (Armstrong,2009).
Intrapersonal intelligence	Comprises the capacity to understand oneself, to appreciate one's feelings, fears and motivations (Christison,2005).
Naturalist intelligence:	Centered on the ability to recognize, categorize or classify items including but not limited to plants, and animals(Gardner,1999).

2.3 MI and Active learning

Gardner (2011) theorized that society has traditionally valued linguistic and logical-mathematical intelligences more highly than other intelligences, and students who excelled with these intelligences were more likely to succeed in the educational system. As a result other talents, qualities or intelligences are considered less valued in the current educational systems, perhaps leaving other students behind. Different methods and activities should be employed to meet the needs of all students and not only of those who excel in reading and writing. MI theory can be used in many different ways and has the potential to work well in the entire school system as it offers opportunities for students to use and develop various intelligences, not only the ones that they excel in with the result being deeper, active learning (Nolan, 2003).

2.4 Content Language and Integrated Learning (CLIL)

One approach, particularly in tertiary education streams, to tackle the issue of teaching content and language is through content language and integrated learning (CLIL), an approach that is viewed as offering a dual focus to address the challenges associated with learning new subject matter and language while developing communicative skills (Ball, Kelly &Clegg, 2015). Together with and concentrating on instruction of fundamentally interesting, authentic, and motivating content – typically through communicative language teaching and task-based

learning, CLIL methodology has been considered particularly useful in vocational settings such as health related fields (Commission of the European Communities, 2012). CLIL may be viewed as a more beneficial approach than other methods as its flexible methodology promotes conditions to unite content and language learning in ways that are difficult to implement in language classrooms' (Nikula, 2007).

CLIL is a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language. That is, in the teaching and learning process, there is a focus not only on content, and not only on language. Each is interwoven, even if the emphasis is greater on one or the other at a given time (Coyle, Hood & Marsh, 2010).

The defining features of CLIL consist of the 4Cs (figure 1): 'content' specifically subject matter, 'communication' involving language acquisition and utilization, 'cognition' namely the processes of learning and thinking and lastly 'culture' with the development intercultural understanding and global citizenship (figure1). The 4cs are viewed as working cooperatively to utilize language to learn effectively as well as actively while at the same time suitably or correctly utilizing the target language bearing in mind the strong possibility that the it may not be at the same cognitive level (Coyle, Hood & Marsh 2010). Briefly Content The term "Content" refers to subject matter, which may include science, health, politics or biology, in which an authentic topic is illustrated for example thermal energy, stress in the work place, or lowering the voting age etc. The term "Communication" is concerned with the means or mechanics of learning content, such as knowledge of the language pronunciation, grammar, and vocabulary or language skills such as reading, writing, listening and speaking (Ikeda, 2012). The Language Triptych demonstrates the inter-reliance between content objectives and language objectives.

An chief component of CLIL methodology is that pedagogical content is delivered in L2 with the purpose of developing L2 lexical and communicative competence ideally in all four language skill areas: speaking, writing, listening and reading while simultaneously promoting higher level thinking skills and L2 motivation (Coyle, Hood, & Marsh, 2010).

In order to aid in the promotion and maintenance of learners cognitive presence in L2, CLIL methodology the implementation of strategically scaffolded curricula, providing sufficient support and incentive for learners to feel confident in using the L2 to a greater extent is advised (Nikula, 2007). Specifically, in CLIL methodology communicative competence is developed and promoted through dialogic interaction, group work and cooperative learning to foster critical thinking and subject understanding (Coyle et al., 2010). Advocates of CLIL methodology contend that it produces significantly improved language outcomes as well as active learning (Várkuti, 2011).

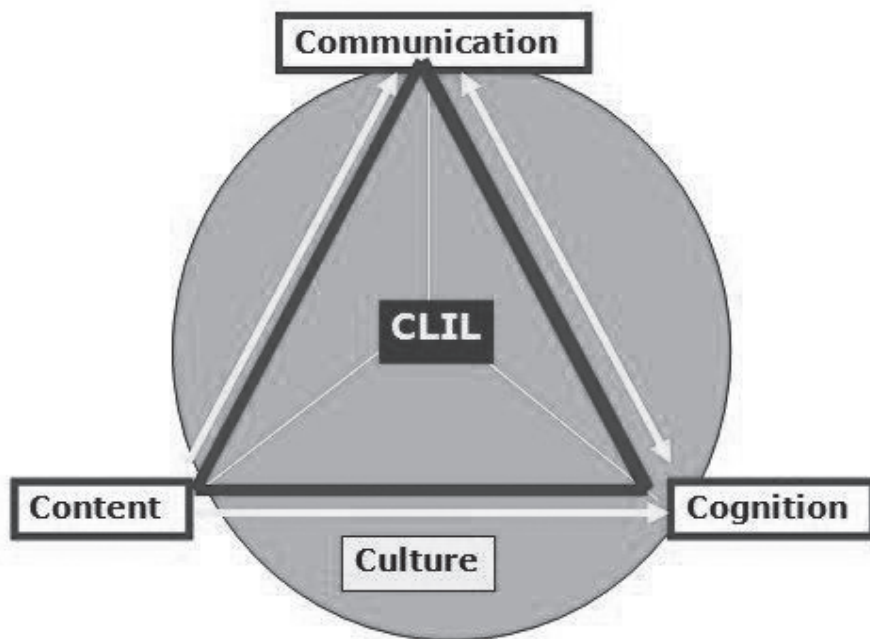


Figure 1: 4Cs Framework (Coyle, Hood & Marsh 2010: 41)

2.5 CLIL and Japan- European connection Asian application?

Although there is no one CLIL model, CLIL techniques and approaches have become very influential in relation to language learning and teaching, particularly in the European and more recently Japanese contexts (Dalton-Puffer 2011; Ruiz de Zarobe 2013, Ikeda, 2013).

Until recently the bulk of CLIL research has been within the European context (Costa & Coleman, 2010), although the benefits of CLIL are undisputed some researchers have questioned the ability of Asian educators to effectively incorporate both more communicative methodology and higher-order thinking skills in to EFL curricula (see for example Goto-Butler, 2011), but recently CLIL research in the Japanese context seems contradict this notion of CLIL as a European ideal. Ikeda (2013) reported that with properly trained instructors as well as contextual factors recognized.

CLIL maybe successfully implemented in Japan. Additionally, Yamano (2013) found that EFL learners appeared motivated by CLIL methodology, indicated by more cognitive awareness of global issues, and enhanced vocabulary learning. CLIL methodology transcends task-based and topic-based approaches to language teaching as the authenticity present negates the re-teaching of already learned concepts in a different language and because of the high level of authenticity of purpose achieved through CLIL practices. As Dalton-Puffer (2011) states CLIL has been termed 'a foreign language enrichment measure packaged into content teaching' (p.184).

2.6 MI Theory Application in the CLIL classroom

In CLIL instruction, MI-based instruction can be effective in many ways as the students are given many options and opportunities to express themselves in the English language. Assessment may be tailored to their MI strengths therefore by employing MI in curriculum the students learn and show their understanding in various ways. While paper and pencil measures for example essays and written tests may have a role, they invariably limit the students' responses to utilizing only a few intelligence and perhaps limiting students to relying on their linguistic skills. Whereas the teacher may find out whether a student has a good command of the English language in a written sense and writes well, but he or she may shortchange the students understanding in other ways. Each intelligence provides an entry point through which English can be acquired. While some students may excel in logical exercises such as learning through analysis using grammar charts, conjugation tables, etc. Others learners who excel in linguistic learning styles may benefit from exercises that focus on word forms such as prefix, suffix, and etymology research, etc. While these English teaching exercises may prove helpful to many students, generally other intelligences are not utilized therefore when working with students who don't do well with these types of exercises utilizing other intelligences are key to finding an entry point to language learning.

3. Research question

The purpose of the current research is to apply teaching and learning techniques derived from MI methodology in tertiary CLIL classes to promote active learning, with the following research question considered:

Will the application of teaching and learning techniques developed from MI methodology promote active learning in tertiary CLIL classes?

4. Method

4.1 Research Context

The purpose of the current research is to apply teaching and learning techniques derived from MI methodology in CLIL classes to promote active learning. The current study draws on data obtained from a previous study (Yamauchi, 2015) conducted in a small private university in Northern Japan. The participants (n=55) consisted Information Science students enrolled in a first year compulsory CLIL course considered to be at the same English Language level based on a placement test taken upon entrance to the university. Data demonstrated that the prevalent MI. Results based on class averages indicated the three most prevalent MI perceived by the students were Musical Intelligence with 75.2% followed by Interpersonal at 65.2% and Bodily-Kinesthetic with 62.5%. The three least prevalent intelligences perceived by this sample were Logical-mathematical Intelligence at 47.2% and Spatial at 55.5% and Intrapersonal Intelligence with 57.6%. It was interesting to note that Linguistic (60.1%) and Logical-mathematical Intelligences (47.2%), the two intelligences most strongly associated with language learning, were found in this small study to be less prevalent than the intelligences

typically associated with language learning specifically Musical (75.2%) and Body-kinesthetic Intelligences (62.5%).

Drawing from these results, it could be theorized that if Interpersonal, Musical, and Bodily-Kinesthetic Intelligences were found to be more prevalent than Linguistic or Logical-Mathematical Intelligences with these students, activities and techniques within the syllabus should be altered in an effort to satisfy the needs of these learners (Armstrong, 2009).

4.2 The Instrument and Procedures

Briefly the quantitative research consisted of an MI inventory designed by the researcher (Yamauchi 2014) containing five questions pertaining to each of the eight intelligences with students' scores shown out of a possible 25 (see figure 2). A letter code was given for each intelligence with a total of 40 questions the questions were presented randomly with a five-point likert scale devised as follows 1 = statement does not describe me at all, 2 = statement describes me very little, 3 = statement describes me somewhat, 4=statement describes me pretty well and 5 = statement describes me exactly. The MI inventory was first designed in English and then translated into Japanese. The inventories were completed in the second week of the school year, with general explanation of the MI inventory provided as well as a reminder that the students' answers would be completely anonymous in an effort to prevent anxiety or stress as well as to promote candid responses (Armstrong, 2009). There was no time limit for completion of the inventory.

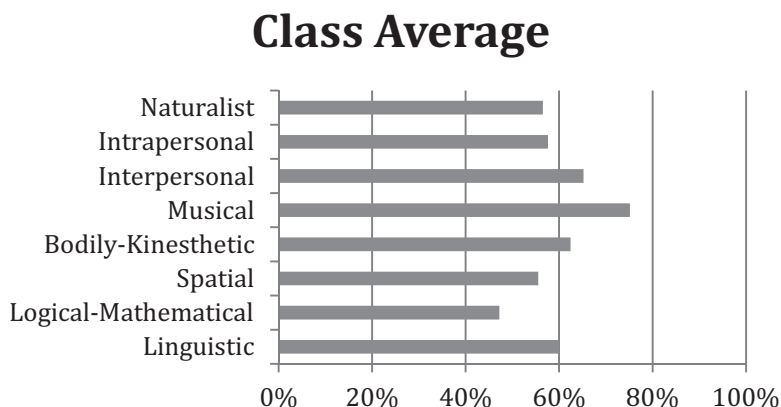


Figure 2: Graph of average scores for each intelligence (n=55) (Yamauchi, 2015)

5. Results and Discussion

5.1 MI Derived Techniques and Activities

MI and its connections to various EFL Teaching Methods (Armstrong, 2009) Drawing various teaching methods linked to MI in order to achieve active learning within these CLIL the following approaches can be linked to Gardner's (1993) intention of developing and using different kinds of intelligences. Total physical response emphasizing language learning through

physical action (bodily/kinesthetic intelligence). suggestopedia uses drama and visual aids as keys to unlock a students' learning potential; music plays the greatest role in facilitating learning draws on musical intelligence (Eisner, 2004).

Communicative approach and cooperative learning seem to place their greatest emphasis upon the importance of interpersonal relationships (interpersonal intelligence) in language learning promoting active learning with students (Armstrong, 2009). Whole language learning has at its core the cultivation of linguistic intelligence, yet it uses the hand-on activities, music, introspection (through journal keeping), and group work to carry out its fundamental goals. The whole language learning approach not only emphasizes the wholeness and reality of language (verbal linguistic intelligence), but also highlights that the coordination of bodily/kinesthetic, musical, interpersonal, and intrapersonal intelligences is needed to promote active language learning (Eisner, 2004).

5.2 Cooperative Learning

Cooperative-learning (CL) is an outstanding example of an effective teaching strategy for lessons targeted at utilizing MI particularly as within the group structure there may be many opportunities afforded to activate various MI promoting active learning (Armstrong, 2009). In CL, students work together in small groups on a structured activity with the group members individually accountable for their work, and the work of the group as a whole is also assessed (Johnson & Johnson, 1999). CL permits the opportunity for language development by allowing students to learn in a natural authentic environment increasing independence from the teacher, promoting learner autonomy thus active learning. A common teaching approach to CL is the Jigsaw approach (Jacobs, Power and Loh, 2002). In the jigsaw approach to instruction, material is divided, generally into four parts, and distributed to small groups to learn. In this activity a target reading passage is divided into four sections, labeled A-D. The students read their portion of the passage silently then all the students with the same lettered passage gather together to discuss and master the meaning. Finally they return to their original groups and decide the order of the passage. All MI may be considered activated with this activity but specifically as peer teaching and group problem solving are used to complete the jigsaw, specifically with this sample the stronger Interpersonal Intelligence, weaker linguistic intelligence we observed activated as the students were reading in groups.

Utilizing the data as well as through observation activities were strategically incorporated into the syllabus that catered specifically to the students prevalent MI while at the same time striving to develop less prevalent MI. for example if students possesses a dominant interpersonal intelligence there is a probability that they will enjoy participating in group work activities thus increasing motivation leading to active learning as well as eventual language learning (Visser, Ashton, & Vernon, 2006). It is important to note at this juncture that when utilizing MI in designing activities to satisfy learners' needs, it soon becomes apparent that one MI does not exist in isolation; therefore, an activity designed for one MI may also cater to another MI (Armstrong, 2009).

5.3 Music and Test Preparation

Using music has been popular technique in language classrooms. With the goal of test preparation MI based activities promoting Musical Intelligence can aid in increasing motivation as well as class participation. (Yamauchi 2014). For example, cloze exercises where students listen to a song and fill in blanks with lyrics they hear is an effective way to generate further, students' Musical Intelligence (Armstrong, 2009). With recent MEXT initiatives and mandates requiring university graduates obtain scores that demonstrate the ability to communicate in English effectively in the workplace English proficiency tests such as TOEIC (Test of English for International Communication) are an inescapable reality for most all Japanese University students (MEXT, 2011). The students involved in the present study are no exception, as they must take TOEIC at least once a year. The preparation for this test is done during regular class hours and through student interviews in addition to casual observation the class participation as well as classroom attendance during this period is undoubtedly the lowest for the year. In seeking a approach to these classes MI generated techniques and activities may be considered useful. For example a Musical Intelligence based activity that coincides with sentence-completion section of the TOEIC for TOEIC preparation is a cloze activity with the students given handout and while working in pairs try guess grammatical functions for each blank before they listen to the music. As the students must find the correct words or phrases to complete sentences focusing on grammatical forms and logically discover answers. While working in pairs, they check their answers. In addition, by eliciting the answers from students' problem solving skills are utilized. This music activity aids student's development of linguistic, musical, logical-mathematical, intrapersonal and interpersonal intelligences while at the same time promoting active learning.

6. Conclusions and Implications

Utilizing results from an MI Inventory employed as a method to ascertain learners' perception of their prevalent intelligences interpersonal and bodily intelligences, not typically linked to language acquisition, were found to be more predominant than the standard linguistic or mathematic-logical intelligences with these first year classes this study examined how MI generated techniques and activities may be developed in order to accommodate students' prevalent intelligences and perhaps stimulate dormant MI while discovering that with the intention of improving motivation, promoting learner autonomy as well as active learning. Practical interventions such as the incorporation of the teaching strategies cooperative learning and the use of music for TOEIC preparation were presented and offered as a means to improve motivation, promote learner autonomy as well as active learning. It was also revealed through the application of these MI derived activities that one activity or technique may cater to several intelligences simultaneously. In addressing the research question: Will the application of teaching and learning techniques developed from MI methodology promote active learning in tertiary CLIL classes?

The feedback from MI generated activities has been extremely positive and the students'

responses to questionnaires have been optimistic. Sample comments from exit interviews included students' comments that the content was easier to understand through the use of MI generated activities, and tasks were more enjoyable and completion faster as the students could work together in groups utilizing each other's strengths. With regard to the TOEIC preparation classes attendance was much better than in previous years and the students commented that the time went faster indicating that perhaps their attention had been held and their interest increased with the input of MI techniques and activities.

Furthermore there have been many unsolicited positive comments from the students and in general the attitude, interest and the amount of time students stay on task appears to have increased with the application of these MI derived activities. All of the MI derived activities were designed as learner centered and students were well aware of the purpose and expected outcomes from their participation therefore on the surface the promotion of Active learning was perceived as achieved within this CLIL context. Additional study is indicated in to determine Whether deep understanding or learning was established as further research examining issues such as TOIEC score increases or the amount of voluntary study done outside of the classroom may offer more concrete information Finally looking to future studies increasing sample size or adding a quantitative research instrument such as a tool to measure students learning strategies in conjunction with their prevalent MI may offer more information as to the benefits of MI generated activities in this CLIL context.

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