One of the stated benefits of content-based language teaching is that it places the target language in the position of a means of communication rather than as a subject of examination. As Widdowson (1978) states, content-based language teaching "...provides us with the certain means of teaching language as communication, as use rather than simply as usage" (p. 17). While the focus in traditional English classes is on skills development, the content course acts to stimulate the students to act and think through use of the target language and, thereby, develop their language skills holistically (Snow, S. & Brinton, D, 1988).

Most such content courses are sheltered versions of university subject areas. These usually consist of courses in such staples as history, geography, government, and specific area studies. However, courses centered around other university subject areas are also often found depending on the immediate context in which the particular course is being taught. ESL students in a university preparation program might, for example, find themselves enrolled in classes dealing with subjects such as psychology, philosophy, or computer science.

What is being suggested here, however, is a course which is seldom if ever mentioned in the context of content based instruction: logic. While logic is not as common or popular a subject area as others mentioned so far, it is offered in most American university curricula. While usually placed within departments of philosophy, courses in logic, particularly courses in propositional logic, are in many cases accepted as fulfilling certain university breadth requirements in quantitative reasoning, thus expanding their appeal beyond the circle of philosophy majors. As a more or less standard university course, logic stands equal with the courses already mentioned as a choice for sheltered content instruction. However, for the EFL student, a content course in logic can be shown to have numerous advantages beyond those which are commonly accepted for such sheltered courses.

Dictionaries most often define logic as the branch of philosophy that deals with forms of reasoning and thinking, and it is in this context that most people think of logic. As a consequence of this general view, a view with a focus on the philosophical dimension of logic, it is natural that any course in logic taught in a
multicultural setting would be seen as comparative, that is a comparison of differing cultural thought patterns. This is not, however, the gist of what is being suggested here.

Rather than a philosophical analysis of thought patterns, a symbolic approach to propositional logic instead seeks to develop the students’ ability to reason, not by understanding alternative or prototypical patterns of thought, but rather by developing problem solving skills through recognizing arguments and then examining and determining their structural validity. This symbolic approach to propositional logic is concerned with evaluating the form rather than the content of arguments (Pospesel, 1984).

In this sense it is not a comparison of different thought patterns. It is not a comparison of Japanese thinking versus, what is erroneously grouped together as, Western thinking. In fact, even if a case could be made for such a definition, it would still remain irrelevant as the focus of such an approach is not on how people think, but rather on how one person can utilize his or her own mind to reach a desired outcome. Students in a course of this nature, are not examining how A and B think, but are instead determining whether point A, point B, and point C lead to point D - in what is, in many ways, a context free manner.

In this sense, logic functions much in the way of pure mathematics, unfettered by nuance and meaning. And like mathematics, the analysis of what is essentially a linear progression of premises and outcomes requires the utilization of non-linear patterns of reasoning. It is this fact that removes any notion of inherent cultural patterns of thought from the process of logical analysis as students are allowed, or even encouraged, to utilize and develop any methods of analysis and problem solving at which they are thereto adept.

To make this easier to imagine, one might use the analogy of a jigsaw puzzle. The outcome of any puzzle is the same: the completion of the cover image on the box by connecting predefined interlocking pieces. Different people employ different strategies to achieve this goal. Some start by connecting all the outside pieces and then working inwards. Others start by connecting pieces of a readily identifiable graphic element. And still others work by first connecting similar hues into larger units. Each person approaches the puzzle by utilizing his or her own preferred strategies.

In the case of logic, the cover image can be likened to the conclusion of an argument, while the individual pieces of the puzzle can be likened to the premises of that argument. The interlocking patterns of those pieces, which regulate what we can put together and how, work like the rules employed in logic. And just as in the case of the puzzle building, the actual thought process that takes place in the construction of logical proofs varies according to individual preference and ability.

This symbolic approach to logic involves the use of a series of rules by which students construct proofs in order to determine the validity of a given argument. The core set of these rules consists of the following: Arrow In ( AppModule) and Arrow Out ( AppModule) for dealing with if...then structures, Ampersand In ( AppModule) Ampersand Out ( AppModule) for dealing with the conjunctions and and but, Tilde In ( AppModule) and Tilde Out ( AppModule) for dealing with negations, Double Arrow In ( AppModule) and Double Arrow Out ( AppModule) for dealing with if and only if sentences, and Wedge In ( AppModule) and Wedge Out ( AppModule) for dealing with disjunctions. There is also a series of shortcut rules which are based on
these primary rules and act to reduce the number of steps required in creating a proof.

These rules are used by themselves or in conjunction with one another to derive a given conclusion from one or many premises. The following is an example of a rather simple argument, its symbolization, and proof, which demonstrates a number of these rules in actual use:

The government may RESTRICT the publication of the news if it can FORCE the publication of news. Since the government may not restrict publication, it follows that it is also not permitted to force the publication of news.

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What has been stated thus far about this particular approach to logic would seem to make it an odd choice as a course in an English curriculum as it is not focused, per se, on the actual content of an argument. In fact, the symbolic nature of the approach would seem to remove any English content from such a course. This is, of course, not totally true, but to the degree that it is or seems to be true, it can work to great advantage in terms of English teaching. This seeming contradiction can be explained by re-examining and expanding upon those factors which are commonly agreed upon as constituting affective barriers in the learning of English or any other foreign language.

H. Douglas Brown provides a list of those affective variables most associated with language learning: empathy, self-esteem, extroversion, inhibition, imitation, and attitude (1994). All of these proffer both assets and liabilities to the learner; however, it is anxiety which is generally seen as having the most negative effect (Kleinmann, 1996). Brown mentions both trait anxiety, which is essentially innate, and state anxiety, which is related to a particular event or situation. While both forms of anxiety can play a negative role in students learning, it is only in the case of state anxiety where a teacher can attempt to alter those factors contributing to the condition.

Somewhat ironically, in many situations, particularly in Japan, it is the subject of study itself, i.e. English, which brings about such pangs of state anxiety. In this sense, the superficial □ Englishlessness □ of this approach to logic can thus be seen as beneficial. Because the focus of the course is not on English but rather on logic, the source of anxiety, English, is removed as an obstacle. Logic thus works as a subterfuge by which
English is introduced and utilized almost subconsciously as the students concentrate on seemingly unrelated tasks.

What then constitutes the English side of logic? In fact, there is inherent much, in a course which teachers logic through English with English arguments as the basis of analysis. The primary and most essential step in the approach is that which seems, at casual observation, to be primarily responsible for the apparent absence of English - the symbolization process. One of the immediate benefits of this process is familiarization with keywords. In order to symbolize a sentence, it is first necessary to assign a symbol for a given simple statement or constituent of a compound or complex statement. This is usually done by using the first letter of one of the keywords. This process aids the students in terms of comprehension by allowing them to reduce otherwise unmanageable strings of text into comprehensible lexical sets. The sentence "Providing AID to the Israelis in the present state of tensions will act to foster increased Palestinian RESENTMENT and thus lead to continued VIOLENCE in the occupied can thus be reduced to a more manageable "(If aid, then resentment; therefore, more Violence).

Another positive feature of Logic is the depth to which it familiarizes students with semantic differences within English structure. The process of symbolization, for example, acquaints students with the first of these differences in the form of the suppressed conditional. An example of this would be the sentence "Keep MISSING assignments and you will FAIL this class." Although in this case native-speaker intuition makes it clear that this is in fact a suppressed conditional rather than a conjunction, students are tempted to employ a literal symbolization of the statement in the form of "If you keep MISSING assignments, you will FAIL this class."

This awareness of meaning versus surface form is again witnessed in regard to the symbolization of the connective but. The connective but, although carrying the marker of contrast, does so only in its surface representation. At its core meaning, however, it is little different than its associated partner and. This is a point that is missed even to those in possession of native-speaker intuition as the but/and pair is so well ingrained in the semantic subconscious of our discourse. Nevertheless, in logic both but and and are treated in the same way, as they are, despite differences in nuance, conveying identical information.

This fact can be most clearly appreciated by examining the following two sentences:

She likes COFFEE and TEA.

She LIKES coffee, but she seldom DRINKS it.

The first sentence conveys two equal bits of information, namely "She likes coffee" and "She likes tea." In view of this, it is easy to understand why the connective would be symbolized as "and", resulting in "and". The second sentence, however, is no different in that it too conveys two equal bits of information: "She likes coffee" and "She seldom drinks coffee." Whether the sentence is showing equivalence or contrast is
irrelevant in terms of logic as in either case multiple quantities of information are being provided. The *but* sentence is, therefore, also symbolized by use of ⊼ to represent the connective, thus yielding ↓↓↓↓.

Rules can also shed light on the deeper meaning of surface structures and the Wedge In Rule (vI) is a good example. Wedge In states that from any single premise you can add anything in the form of an or statement. Thus, from the, now dated, sentence ⊼If Bush LOSES the election, he will CONTINUE on as governor of Texas ⊻one can derive any of the following:

*If Bush LOSES the election, he will CONTINUE on as governor of Texas,...*

or become a TEACHER...

or become a TEACHER or a RANCHER...

or open a small STORE in Austin and sell cowboy HATS...

or be the NOMINEE again in 2004 if he still has PARTY support...

For students, this rule seems hard to accept as it seems too open-ended and simple. And yet, when put into a more personally relevant context, it becomes clear that the disjunct or simply introduces possibilities. Students upon graduation, for example, may find themselves in any one, or more, of a variety of situations. They may work for a big company, or for the city, or at a gas station or convenience store or auto dealer, or they may continue on as graduate students, or study abroad, or find themselves unemployed. There are limitless possibilities, none of which can be precluded at the given moment in their lives. Thus the students can see their post-graduation future as a continual chain of disjunctions extending *ad infinitum*, thereby giving real meaning to the rule itself.

Of course, arguments exist not only in exercises designed specifically for the task of developing proofs but all around us in life. It is not, however, always so easy to recognize arguments, and not all arguments include stated conclusions. After students attain some level of expertise in working with proofs, they are then taught to determine and restate arguments and provide unstated arguments when necessary. Comic strips and films are good sources of such material in this more English-intensive phase. The film ⊼City Slickers, for example, provides a good and easily decipherable argument in the following dialogue between a husband and wife.

Wife: *I hate you!*

Husband: *I hate you more! If hate were people, I ⊻be China.*

The premise to the argument in this case is easily restated as ⊼If anger were PEOPLE then I ⊻be CHINA ⊻However, as there is an unstated premise in the argument and no conclusion, students must determine these on their own, most often offering: *But anger is not people, so he is not China.* This denying of the antecedent ⊼However, is inherently invalid, as students learn. Students then must rethink the argument, after which they are usually able to produce the more appropriate (and valid): *He is not China,*
therefore anger is not people therefore anger is not people. Students can then go on to construct a proof for the exchange (in this case utilizing one of the derived, or shortcut, rules):

1
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3 $\sim$

Another example comes from the Peanuts comic strip. In this strip, Charlie Brown's sister offers the following argument which is stated in the right two frames:


The students first restate the argument as Brackets are GOOD only if they are in PAIRS. Therefore if they are not in pairs, they are not good which is one of the possible restatements, and then go on to construct a proof.

1 1
2 2 $\sim$
3 3 $\sim$

The question may arise as to the difficulty level of such a course in logic. While on the surface it may appear somewhat difficult, it is not necessarily so. This is particularly true for students whose analytical skills are inherently or latently strong. For many students, who may otherwise have trouble with a direct approach to English, logic comes as less cumbersome and threatening. This is similar to the phenomenon in which students who are otherwise weak in mathematics do well in a course in symbolic logic despite the similar analytical skills required in both. Just as the mathematics student weakness stems from a fear of numbers, the English student weakness stems from a fear of or unease with the language itself - the oft mentioned English allergy. For such students, logic can seem less threatening and, therefore, much easier than an English course employing a more head-on approach.

However, even for those students who do not have such an allergy and feel, for the most part, at ease in a
conventional English course, such a course in logic is still not any more difficult than any other course. This holds true for students who are not particularly strong in terms of analytical skills. The step-by-step approach to the various facets of the course are easy to understand provided the student keeps up with the class as all aspects of the course are highly interrelated. The rules employed in logic, with perhaps the exception of the Wedge Out rule, are also fairly easy to comprehend and apply and, thus, provide little difficulty to the student. Furthermore, as has already been stated, the nature of the symbolization process allows students, who would otherwise have a difficult time at trying to comprehend the meaning of passages beyond a certain level, to deal with and understand more difficult levels of material.

Despite these facts, there can be no doubt that, at casual observation, logic appears to be difficult to students. Perhaps it is due to their unfamiliarity with the subject or their surprise at having their analytical skills challenged in what is most often seen as a right-brain subject area (although, language functions are, in fact, generally considered to be left brain centered). It is the teacher’s role, therefore, to reconcile the students’ differences in expectation. In the case of logic, it is only through the process of doing that students can come to feel the simplicity of the subject matter.

While a symbolic approach to propositional logic may seem an unlikely addition to an English as a foreign language program, it can be a valuable and meaningful one. In regard to content, the analytical skills developed through such a course are sure to prove of at least some benefit in other areas of their studies as well as their lives as a whole.

In terms of English content, at both the lexical and grammatical levels, logic provides students with a deeper understanding of the workings of the language by taking them below its surface, so to speak. It allows them not only to deal with materials containing vocabulary and structures of a complexity beyond their present ability level by providing clarity through simplification, but also helps to foster awareness of the arguments which surround them in one form or another in daily life. In addition, due to the very nature of such a course, students who would otherwise be hesitant to further their studies in English can do so without being hampered by any negative predisposition they might have toward the language.

References


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