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English Language Learning in the Framework of Three Dimensional (3D) Approach: Linear?, Areal?, or Spherical?

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Abstract

Learning a foreign language has become a necessity in today's globalizing world. Learners are guided through mainly staged (e.g. basic, elementary, pre-intermediate, etc.) language programs using learning materials with certain time allocations. In this system, all levels usually have almost the same amount of time for the learners to master. This study tries to find answers to some controversial questions such as "How long does it take to learn a foreign language?" and "Does each level of a language require the same amount of time?". Since English is the most common foreign language that is being learned today, the study takes English learning as contextual sample. The concepts "linear", "areal" and "spherical" are suggested to discuss the myth of time allocations. As opposed to the idea of one dimensional learning of a foreign language, three dimensional (3D) language learning is proposed.

Keywords: English, Language Learning, Three Dimensional (3D), Linear, Areal, Spherical

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Introduction

How long does it take to learn English? How long should students receive support to learn a foreign language? Is the time needed for one level of the targeted foreign language the same as that of another level? These are the most common but vital questions asked by language learners, teachers, administrators, material designers etc. (Collier, 1989; Eaton, 2011; Hakuta, Butler, & Witt, 2000; Haynes, 2010). The questions are clear enough but the answers are not because they vary greatly from one another. This paper is trying to find basically a legitimate answer to the question "How long does it take to learn a foreign language?"

"Language acquisition is a complex process that involves communication, grammar, structure, comprehension and language production along with reading, writing, speaking and listening, just to name a few of the simpler aspects of language learning." (Clay et al., 2009; Eaton, 2011, p. 2; Gass & Selinker, 2008; Juffs, 2011). Providing a realistic length of time needed to learn a foreign language is crucial because when it is underestimated, upon seeing that language learners cannot use the target language well, they fall into desperation. They lose reportedly their confidence and self-esteem, which leads them to giving up learning the language before they master it. It takes these learners significant amount of time to get over the feeling of failure later on in their life.

Wrong estimation of the length of time required to learn a language has also counterproductive and adverse impacts on other stakeholders (e.g. instructors, parents, and other people around the learners' immediate surroundings). Language learners who cannot produce meaningful target language within the unrealistic time circle are very often

considered to be less intelligent, devoid of cognitive, academic and communicative skills, lazy, and underperforming. Callahan (2005) argues that:

Teachers, principals, and counselors frequently, though perhaps inadvertently, interpret limited English proficiency as a form of limited intelligence and place students in low-track classes to compensate for this perceived deficiency. Placement in low-track classes contributes to the perception of English learners as limited: limited in language, knowledge, skills, and cultural competencies (p. 312).

Learning a foreign language (e.g. Latin) was a topic of intellectual development to enjoy reading and understanding works of literature for pleasure and one of the indicatives of a person's social status in the past. Producing language skills such as speaking and writing were of no priority, nor were language-learning methodologies diversified as today. No practical outcome was expected from learning a foreign language. The picture of today's learner profile is different from that of the past as described. Today's learners are learning a foreign language, especially English, for practical purposes such as education, better employment opportunities, travel, immigration etc. Therefore, they start learning it with an assumption on mind that they will be able to use the language after a period of time claimed by language programs, instructors, administrators or language teaching material designer.

Basic factors affecting the time required learning a language

Language learning or language acquisition (though there has been a huge debate on the distinction of the two terms, they are used interchangeably in this paper) leads to language proficiency as the end product of language learning education. Language proficiency is defined as "The degree to which non-native speakers are able to maintain the attention of their interlocutors, avoid communication breakdown, and achieve their communication goals" (Bialystok & Feng, 2011; Rossiter, 2009, p. 396). Stevens (1999) points out that "language acquisition is a multi-dimensional phenomenon to be explained through a combination of linguistic, neurolinguistic, and psycholinguistic processes" (p. 555). Therefore, the time needed to learn a foreign language depends on a number of factors some of which are age (Archibald et al., 2006; Bialystok & Hakuta, 1999; Birdsong, 1992; Sakai, 2005; Swain, 1972), gender (Costa, Terracciano, & McCrae, 2001; Feingold, 1994; Pomerantz & Saxon, 2001; Berninger et al., 2008), minority or majority language (Archibald et al., 2006; Eaton, 2011; Cummins and Swain, 1986), socioeconomic status (Hakuta et al., 2000; Hoff & Tian, 2005; Pungello et al., 2009), cultural perceptions and acculturation of the target language (Cervatiuc, 2009; Spenader, 2011), teaching methodology (Hinkel, 2011; Ellis & Robinson, 2008). Since the scope of this paper is basically on time allocations, only a few of the aforementioned factors will be touched below.

Age

There is a close relation between age and the time required to learn a language (Archibald, Roy, Harmel, Jesney, Dewey, & Moisik, 2006; Bialystok & Hakuta, 1999; Birdsong, 1992; Swain, 1972). At what age a language learner is exposed to a foreign language has a huge impact of his/her attainments in linguistic skills. Sakai (2005) reports "an L2 can be mastered at any time in life, though the L2 ability rarely becomes comparable to that of L1 if it is acquired beyond the hypothesized "sensitive period" from early infancy until puberty." "If second-language acquisition begins at age 5, it follows a different pattern than when second-language acquisition begins at age 25 or at age 15."

Minority or Majority Language

It makes s difference if one is learning a minority language or a majority language (Archibald et al., 2007; Cummins and Swain, 1986). For example, if you live in an English-speaking country and you are learning French, you are learning a minority language. But if you are French living in the USA and learning English, you are learning the majority language. If you're submersed in a language, the learning process is different because you're being exposed to the language more for more hours per day, on a consistent basis (Cummins & Swain, 1986; Eaton, 2011).

Socioeconomic Status

Language learners' socioeconomic status (SES) is another factor affecting time to learn a foreign language (Hoff &Tian, 2005). In a study by Gayton (2010), "a correlation between low SES and low motivation on the one hand, high SES and high motivation on the other" is implied (p. 26). "Students from lower socioeconomic status are the ones who on average are learning English more slowly, and thus would be most affected by time limits" (Hakuta et al., 2000, p. 13). Pungello, et al. (2009) reported in his study that "lower SES parents, all of whom were African American, had children with the lowest language skills and shortest mean length of utterance compared with children displaying more advanced language skills, who were predominantly European American and from higher SES families" (p. 544).

Different suggestions for time allocations

"A general observation is that there is an inherent ambiguity in the notion of time in language" (Gullberg & Indefrey, 2008, p. 207). This ambiguity is instigated by different understandings and definitions of language learning and level of proficiency. Thus, the answer to the question, "How long does it take to learn a language?" varies from person to person who works in the sector of education.

One of the stakeholders of language education is print companies that produce and print language teaching and learning materials. As Eaton (2011) states:

Companies that sell language learning products or software may claim that their method or materials will guarantee fluency in a certain period of time. Usually, that time frame just happens to correspond to their particular program. Language experts tend to be skeptical of claims that a certain method can guarantee fluency in a short period of time (p. 1).

A few examples for such learning products to name are 'Total English' series, 'Headway', 'Success First Certificate', 'Top Notch and Summit', 'Language Leader', 'Academic Connections', 'Cutting Edge', etc. In organization, such English learning products are adjusted to generally 6 different levels from the lowest one, 'basic', up to 'elementary', 'pre-intermediate', 'intermediate', 'upper-intermediate', and 'advanced'. The language learning products assert that 80-120 hours is enough to master one level and pass on to the next one. Almost all of them suggest the same time period required for each level indiscriminately. Hence when a language learner has completed all language learning levels (from basic through advanced), s/he will have studied totally around 480-720 hours.

Ericsson, Prietula, & Cokely (2007) carried out a study published in the Harvard Business review to find out how long it takes to become an expert in a certain skill. Since being able to speak a foreign language is a skill, this model can be used in terms of learning a foreign language. Ericsson et al. discovered that "many people are naïve about how long it takes to become an expert" and that a minimum of 10,000 hours "of intense training" is necessary. Since language learning is an area of expertise, Eaton (2011) formulated the "10,000 hours to become an expert rule" into several scenarios to suggest some time periods to learn a

foreign language. "If we apply 'the 10,000-hour rule' as a model of fluency, using the scenarios and a process of deductive reasoning and extrapolation, this is how long it would take to achieve "expert ability" in a foreign language" (Eaton, 2011, p. 7):

Table 1: Time to fluency, according to the Ericsson et al. (2007) of "expertise"

Scenario#1	Foreign language studies at school	96 hours of classes per year	104 years to achieve fluency
Scenario#2	Adult education classes	416 courses of 24 hours per course	If you did 2 courses per year, fluency would be achieved in 208 years.
Scenario#3	Dedicated self-study (Autodidactic)	An hour a day, every single day of the year=365 hours per year	Approximately 27 years to fluency
Scenario#4	Total immersion	16 hours per day, 5840 hours per year	Approximately 2 years to fluency

Another important study on 'how long is needed to master English was done by Thomas & Collier (1997). Thomas & Collier studied the language acquisition of 700,000 Asian and Hispanic English language learners in a well-regarded ESL program in a longitudinal study from 1982 to 1996. They wanted to find out how long it took students with no background

in English to reach native speaker performance (50th percentile) on norm-referenced tests. In their study, Thomas & Collier (1997) found that:

- Those students who were between 8-11 years old and had 2-3 years of native language education took 5-7 years to test at grade level in English.
- Students with little or no formal schooling who arrived before the age of eight, took 7-10 years to reach grade level norms in English language literacy.
- Students who were below grade level in native language literacy also took 7-10 years to reach the 50th percentile. Many of these students never reached grade level norm.

This data holds true regardless of the home language, country of origin, and socioeconomic status.

According to The University of California Linguistic Minority Research Institute Policy Report 2000-1 conducted with around 10,000 students in San Francisco Bay Area and in Canada by Hakuta et al. (2000), oral proficiency takes 3 to 5 years to develop, and academic English proficiency can take 4 to 7 years.

Collier (1987, 1995), Cummins (1981), Mitchell, Destino & Karan, (1997) cited in Krashen (2001), and Ramires, (1992) report estimates of up to 10 years before students are fully proficient in English, i.e., are fully competitive in the academic uses of English with their age-equivalent, native English-speaking peers (cited in Hakuta et al., 2000, p. 1).

Common European Framework of Reference for languages (CEFR) has a different approach to foreign language learning. There are six different levels namely, A1, A2, B1, B2. C1, and C2 according to CEFR. Time allocations for these levels are; A1= 100 hours,

A2= 200 hours, B1= 400 hours, B2= 600 hours, C1= 800 hours, C2= 1200 hours. The European application of time allocations suggests a total of 3300 hours to reach at proficient level in any given foreign language (Cambridge ESOL, 2012).

In the name of putting all suggestions and study findings, the following table was created.

Table 2. Summary of varying views on time allocations for proficiency

English learning material designers (2018)	600 hours (on average)
Ericsson et al. (2007)	10,000 hours
Thomas & Collier (1997)	7-10 years= 40,880-58,400 hours
Hakuta et al. (2000) oral proficiency	3-5 years= 17,520-29,200 hours
Hakuta et al. (2000) academic proficiency	4-7 years= 23,360-40,880 hours
Common European Framework of Reference for languages (CEFR) (2001)	3,300 hours

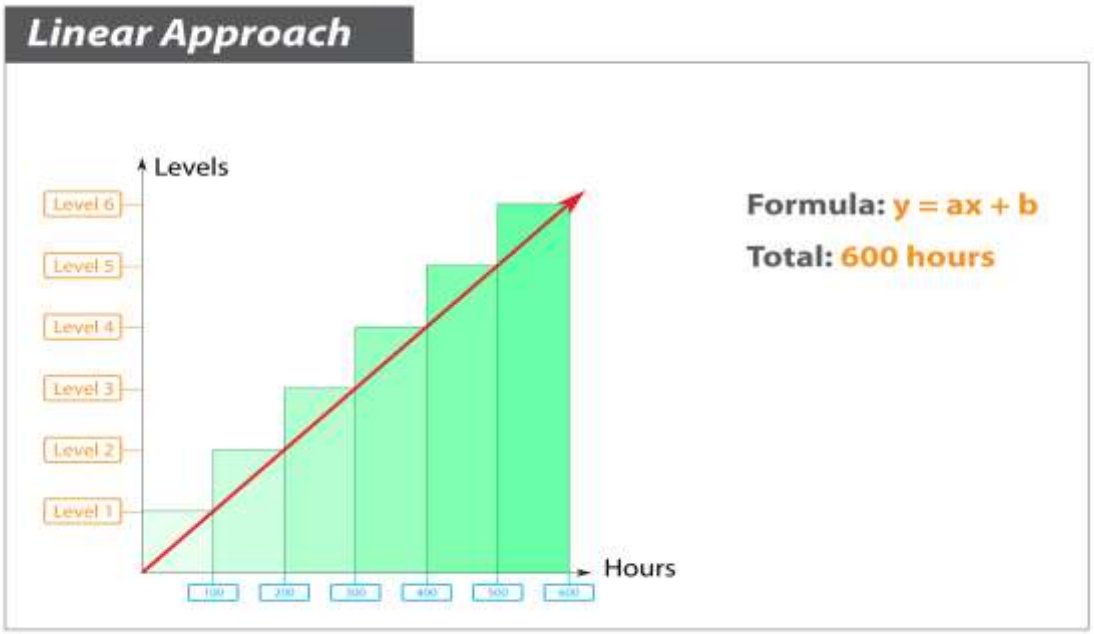
Linear, Areal or Spherical Approach to Time Allocations

Learning a foreign language requires a considerable amount of time under the light of scientific studies shown in Table 2. While learning a foreign language, besides basic skills such as reading, listening, speaking, writing, grammar, vocabulary, we need to understand the cultural background of the target language called ‘cultural communicative competence’ as well (Lustig, M.W., Koester, J., Halualani, R. 2006, Alptekin, C. 2002) which includes

the use of collocations, proverbs, slangs, etc. To make things more complicated, gender differences must be taken into consideration, too Coates, J. (2015), Newman, M. L., Groom, C. J., Haldelman, L.D., Pennebaker, J.W. (2008). Therefore, language learning cannot be approached from a simplistic point of view. The scientific research findings and evidence reveals that there are different approaches to language learning. However, no terminology has been provided to define these different approaches. The following section will suggest some terminology to name different approaches to language learning that exist in today's language learning cycles.

Linear Approach

Linearity is the property of a mathematical relationship or function which means that it can be graphically represented as a straight line according to Wikipedia. Even though the word 'linear' is a term in mathematics, this word is going to be used as a linguistic term to define one of the approaches dominant in non-English speaking countries. If something is linear, it has only one dimension. Thus, it is simple to add things if they are linear. As shown in the graph 1 below, foreign language learning is divided by six different stages beginning from Level 1 (basic level) through Level 6 (advanced level). Each level regardless lower or higher is allocated the same amount of time, 100 hours. According to this graph, it takes a learner around 600 hours to reach at advanced level. Since each level is evenly distributed on a line, this approach is named as 'Linear Approach'



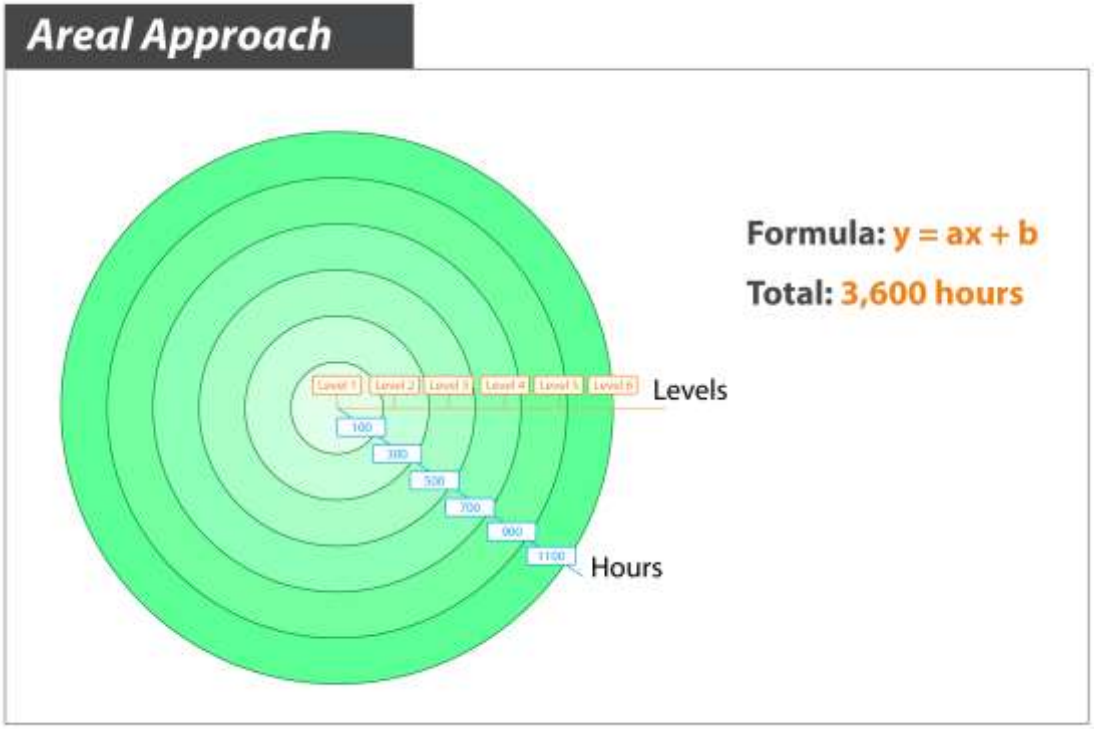
Graph 1: Linear Approach

Linear approach is common in language centers, language prep schools of universities, language education programs in schools in non-English speaking countries. Linear approach has a number of certain advantages especially for content writers, language center managers, and even for language teachers. Because all language learning processes can be designed and executed in parallel with the evenly distributed language levels. Since language learning is commercialized, it needs to be manageable and achievable for language learners. Assuming that each level takes 100 hours, learners begin language education and invest in their foreign language development. Linear approach is the most simplistic approach to language learning.

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
100 hours	100 hours	100 hours	100 hours	100 hours	100 hours

Areal Approach

Areal approach is about the calculation of area. Unlike linear approach, areal approach has two dimensions. Basically European zone has adapted areal approach. According to areal approach, each level has its own unique amount of time to pass to a higher level. As Common European Framework of Reference for languages (CEFR) suggests, from A1 (the lowest level) to C2 (the highest) it takes about 3300 hours of foreign language learning education. Since areal approach is two dimensional, It takes more time to learn a foreign language than linear approach that is only one dimensional.



Graph 2: Areal Approach

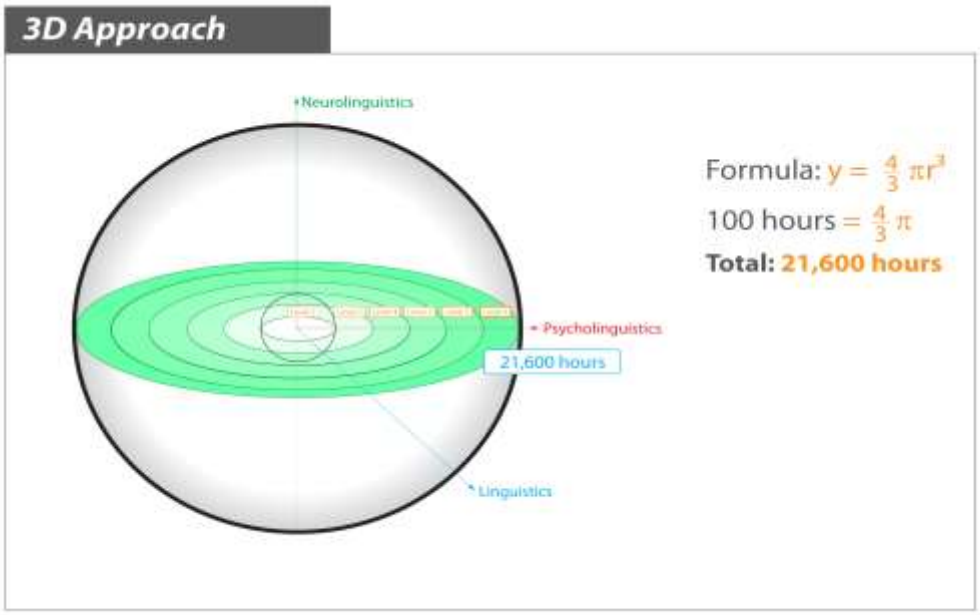
In the areal approach as shown in Graph 2, Level 1 takes 100 hours. Level 2 takes 300 hours. Level 3 takes 500 hours. Level 4 takes 700 hours. Level 5 takes 900 hours and Level 6 takes 1100 hours. Each time allocation is calculated by using the calculation formula for the area of a circle When all time allocations are added up together, the total amount of time reaches at 3600 hours.

Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**
100 hours	300 hours	500 hours	700 hours	900 hours	1,100 hours

Levels, time allocations and area calculations are shown in graph 2. This amount of time of almost the same as that of CEFR, 3300 hours. Because of the calculation of area formula, this approach is called 'Areal Approach'.

Spherical (3D) Approach

Spherical approach (3D) has three dimensions unlike the other two-dimensional areal approach and one-dimensional linear approach. The time allocations shown in table 2 vary from 600 hours (linear approach) to 3,300 hours (areal approach) to more than 20,000 hours (spherical approach). Scientific research findings suggest that reaching at proficiency level or advanced level takes more than 20,000 hours. Therefore, linear and areal approaches are inadequate to explain the research findings which says that foreign language learning has three dimensions as shown in the graph 3 below.



Graph 3: Spherical (3D) Approach

In Spherical approach, rather than area, volume of a sphere is taken into consideration and calculated. Hence, the formula for the calculation of the volume of a sphere is used. According to this calculation, level 1 takes 100 hours. Level 2 takes 700 hours. Level 3 takes 1,900 hours. Level 4 takes 3,700 hours. Level 5 takes 6,100 hours and Level 6 takes 9,100 hours. When the total amount of time is calculated, 21,600 hours is found according to the formula in the graph 3.

Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**
100 hours	700 hours	1,900 hours	3,700 hours	6,100 hours	9,100 hours

The time allocations obtained through the formula for the volume of a sphere seems more compatible with the time allocations found as a result of scientific research. All these time allocations according to linear, areal, and spherical (3D) approaches are added to the table 2 and table 3 is formed as shown below.

Table 3. Summary of varying views on time allocations for proficiency

English learning material designers (2011)	600 hours (on average)
Ericsson et al. (2007)	10,000 hours
Thomas & Collier (1997)	7-10 years= 40,880-58,400 hours
Hakuta et al. (2000) oral proficiency	3-5 years= 17,520-29,200 hours
Hakuta et al. (2000) academic proficiency	4-7 years= 23,360-40,880 hours
Common European Framework of Reference for languages (CEFR) (2001)	3,300 hours
Linear approach	600
Areal approach	3,600
Spherical approach	21,600 hours

Conclusion

"The challenges of learning a foreign language are countless. Those who achieve true fluency do so because they put in dedicated and consistent effort over a long period of time. Claiming otherwise is tantamount to fraud, (Eaton, S.E., 2011).In this respect, having a correct approach to foreign language learning from time allocation point of view plays an important role for learners, teachers, school managers, education planners, and all stakeholders of foreign language learning and teaching. Because one approach claims that total 600 hours is enough to reach at advance level, but on the other hand, another one claims that 3,300 hours is enough to be able to handle a foreign language like native speakers. Scientific research findings suggest that around 20,000 plus hours is needed to learn a foreign language. Even though different approaches exist, no terminology has been developed to name different understanding of time allocations.

The most simplistic understanding of learning a foreign language asserts that there are six levels of learning a foreign language and each of them has the same weight of 100 hours. Therefore, 600 hours is enough to reach at advanced level. Because of one dimensional nature of such distribution, this approach is named as 'Linear Approach'

Common European Framework of Reference for languages (CEFR) suggests that 3,300 hours is needed to master a foreign language. When the formula to calculate the area of a circle which has two dimension is applied, 3,600 hours is found to get advanced level. This amount of time is almost the same as that of CEFR. So that this approach is named as 'Areal Approach'

Scientific research findings reveal that at least 20,000 hours is required to reach at advanced level for a foreign language. Hence, two dimensions are not enough to express this high amount of time to learn a foreign language. Therefore, three dimensions are suggested, which is a sphere. When the formula to calculate the volume of a sphere is used, 21,600 hours is found to cover all six levels. This finding is in parallel with those found in scientific researches. As a result, this approach is named as 'Spherical (3D) Approach'.

In order to create a realistic time frame to learn a foreign language and not to cause misunderstandings or misperceptions, such terms, 'Linear, Areal, and Spherical (3D) are suggested.

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