

How Much Latin Terminology Education Is Enough? The Views of Students

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Abstract: Latin is a common language of science fields in the world such as medicine, biology, pharmacy and agriculture. However, this common language brings about difficulties at the same time. Performing understanding of a subject scientifically with terms the meanings of which are unknown causes difficulties. For this reason, it's necessary to emphasize on eliminating difficulties due to this common language Latin. The aim of this study is to assess the students' views towards biological and anatomical sciences terminology with Latin origin and how they perceive the difficulties of learning the new terms. In 2011-2012 education year spring academic term, a questionnaire was applied to totally 431 students including 141 2nd, 3rd, 4th and 5th class students of Biology Teaching (Faculty of Education), 116 1st and 2nd class students of Veterinary Faculty and 174 1st and 2nd class students of Medicine Faculty. 8 open-ended questions were asked to students. The questions were related with difficulties in Latin education, styles of Latin learning, necessity of Latin terminology and effect of knowing English. The results were evaluated in terms of frequency and percentage. According to the results, students opined about having difficulty in lectures due to Latin, necessity of giving Latin terminology or necessity of new techniques against rote learning.

Key words: Latin terminology • Biology • Medical • Education

INTRODUCTION

Terms with special meanings and being suitable to the subject and content are frequently used in all branches of science and art [1]. The way of providing to communicate better in scientific environment depends on the presence of suitable terminological medium. When leaders of science correlatively use same scientific language, they are recovered from differences in spoken language and the effect of social and cultural factors and this rapid communication between them contributes to the development of language [2]. Medical education and terminology across different languages are faced with potential barriers. One problem is related to the formation of synonyms (and their definitions) in the native language [3]. A second, more daunting problem is related to when the language of instruction is a second language (usually English) of the students [4].

The basis for the terminology of botanic, zoology, medicine and pharmacy sciences is Latin [5]. Anatomy is the basic science field for other medical languages. For this reason, anatomy is the first among other medicine sciences that determines its terms [6]. Clinical medicine and pharmacology terminologies are also based on Latin [7]. Although a vast amount of the anatomical terminology is derived from classical Latin and Greek roots, many more recent anatomical terms are derived from English. Because English became an international communication language [3].

The first traces of the anatomical nomenclature were Greek (Hippokrates of Kos, 460-370 BC), followed by Aristotle (384-322 BC). It was Andreas Vesalius (1514-1564), who replaced all the Greek terms with Latin terms in the first anatomy atlas "De fabrica corporis humani libri septem". Since then, efforts have been made over the last century to manage the large mass of anatomical terms.

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The latest efforts involved those of the International Anatomical Nomenclature Committee that was established in 1936 and issued the first version of the Latin anatomical nomenclature (Nomina Anatomica), with several subsequent revisions published in 1961, 1966, 1977, 1983 and 1989. The new Federation International Committee on Anatomical Terminology made the last revision in 1998 entitled Terminologia Anatomica (International Anatomical Terminology) [8].

The students who desire to be educated in these fields have to know the terminology that is used in common by western countries in order to benefit from international literature [5, 9]. In order to learn terminology, it's not necessary to learn Latin and Greek languages. The meaning of an unknown term can be inferred from the parts of the word. The students can infer other medical words after learning a part of words by studying different parts of medical words [10].

In a recent study by Pampush and Petto [11], the authors found that familiarity with Latin and Greek word roots was only weakly associated with success in a student's anatomy course. However, in contrast to the Pamush and Petto [11] study, Smith *et al.* [12] found that a basic understanding of Latin and Greek etymologies enhances performance when learning and using medical terminology. If you write some of anatomical parts derived from Greek in Greek alphabet, it can be shaped like a Greek letter [13].

Another study by Drury *et al.* [14], they found that doctors were not sure what they are writing on daily basis. There are some common abbreviations used in medical based from Latin. If the doctors know basic practical Latin, they can understand what they are writing.

In recent years, using especially English as a scientific language as well as Latin has lead to using directly English equivalents or abbreviations of terms used in health field as in other scientific fields has become widely used. Nowadays, approximately 75% of terminologies have Latin origin and the rest have English [15]. Learning scientific language necessitates having difficulties for the individuals of every country at variable rates. This difficulty is due to scientific language being a foreign language for everybody whatever their nationalities are. The way for learning scientific language is generally to take new terms as a model and memorize them. The second one is to learn terms as well as their equivalents in spoken language. For the information obtained by the first method to be long lasting, it's necessary to make repetitions while it sticks in the mind longer by the second one [1,2].

Biology makes out necessity for more vocabulary and reading capability. This is an important potential problem for biology education [16]. In the study of Tekkaya *et al.* [17], it was determined that biology students found some subjects quite complex due to their foreign term content and they had difficulty in understanding them.

It's necessary to emphasize that many scientists have difficulty in learning new words, changes in terminology and scientific synonymous [16]. The opinions and difficulties belonging to the students of Biology, Veterinary and Medicine who require terminology throughout their studentship and profession should be determined and new education techniques should be developed to provide a consistent education.

MATERIALS AND METHODS

This study has been approved from Necmettin Erbakan University at 26 January 2012 by B.30.2.KON.0.71.00.00/019 decision number.

Aim of the Study: The aim of this study is to assess the students' views towards biological and anatomical sciences terminology with Latin origin and how they perceive the difficulties of learning the new terms.

Research Model: In this study which was performed to determine the opinions of university students about Latin terminology, a questionnaire developed by researchers and constituting of open-ended questions was applied. Thus, it was aimed to survey awareness of students about Latin terminology, their information levels, their precisions and their opinions at the point of solving problems.

Questions of the Questionnaire Posed to Students:

- Do you have difficulties while learning Latin words used in lectures?
- In what aspects do you have difficulties in lectures due to Latin?
- What do you think about learning Latin terminology before lectures?
- In which class (or classes) should Latin be presented?
- To what extent Latin should be given to increase the success of biology and medical students?
- Can biology and medical education be without Latin terminology?

- What do you think about the effect of knowing English on learning biology and medical terminology?
- What methods of study do you use to learn Latin words?

Study Group: In the spring term of the 2011-2012 academic year, a questionnaire was given to 431 students on paper. Of these, 141 students were second through fifth year biology students, 116 were first and second year veterinary students and 174 were first and second year medical students. All of the students responded to the questionnaire.

Data Collection and Data Analysis: The data of the research included answers of university students (Biology Teaching, Faculty of Veterinary, Faculty of Medicine) for 8 open-ended questions prepared about Latin terminology. The data obtained from open-ended questions were sorted out by three different researchers. The opinions of students stated by students which have similar content were collected under the same category. Then, the data in this category were coded, compared and similar ones were combined. The data were analyzed, frequency distributions (f) were obtained and percentages were calculated. The following abbreviations were used: B for Biology Teaching, V for Faculty of Veterinary and M

for Faculty of Medicine. The numbers next to the abbreviation indicated the student whom open-ended questionnaire was applied.

RESULTS AND DISCUSSION

The answers of students for the question related with in what aspects they had have difficulties in lectures due to Latin were given as pronunciation, orthography, memorization, similar words, in remembering Turkish equivalents, not evoking, not having Latin background, not having difficulty and no answer. The students of Biology Teaching have difficulty at most in memorization and pronunciation, those of Faculty of Veterinary have difficulty at most in pronunciation and memorization and those of Faculty of Medicine have difficulty in pronunciation and similar words. It was determined that the students of all three faculties have difficulty in pronunciation of Latin words commonly. The opinions of some students related with this question are as follows:

- B51: “Since I didn’t know this language before, it is difficult for me to keep new words in mind.”
- B20: “The reading of some letters change when they adjoin and since this is not taught us in the first class, I cannot pronounce correctly due to the problem of not knowing the rules. I cannot say in applied exams.”

Table 1: Findings for the Question “Do you have difficulties while learning Latin words used in lectures?”

Answers	Biology Teaching		Faculty of Veterinary		Faculty of Medicine	
	f	%	f	%	f	%
Yes	96	68.09	59	50.86	62	35.63
No	12	8.51	18	15.52	66	37.93
Partially	20	14.18	28	24.14	30	17.24
At the beginning	13	9.22	11	9.48	16	9.20
Total	141	100	116	100	174	100

Table 2: Findings for the Question “In what aspects do you have difficulties in lectures due to Latin?”

Answers	Biology Teaching		Faculty of Veterinary		Faculty of Medicine	
	f	%	f	%	f	%
Pronunciation	43	26.22	48	37.80	58	28.86
Orthography	16	9.76	2	1.57	7	3.48
Memorization	68	41.46	44	34.65	35	17.41
Similar words	14	8.54	11	8.66	44	21.89
Remembering Turkish equivalent	8	4.88	9	7.09	11	5.47
Not evoking	2	1.22	1	0.79	-	-
Not having Latin background	13	7.92	12	9.44	8	3.98
Not having difficulty	-	-	-	-	24	11.94
No answer	-	-	-	-	14	6.97
Total	164	100	127	100	201	100

Table 3. Findings for the Question “What do you think about learning Latin terminology before lectures?”

Answers	Biology Teaching		Faculty of Veterinary		Faculty of Medicine	
	f	%	f	%	f	%
Be given before lesson	100	70.42	64	66.67	116	65.90
Be given during lesson	3	2.11	6	6.25	19	10.80
Be instead of English prep class	-	-	6	6.25	-	-
No need	16	11.27	14	14.58	31	17.61
No opinion	23	16.20	6	6.25	10	5.69
Total	142	100	96	100	176	100

Table 4: Findings for the Question “In which class or classes should Latin be given throughout your education?”

Answers	Biology Teaching		Faculty of Veterinary		Faculty of Medicine	
	f	%	f	%	f	%
Preparatory class	4	2.82	27	21.6	4	2.40
1 st class	73	51.40	42	33.6	61	36.75
2 nd class	16	11.27	4	3.2	2	1.21
1 st and 2 nd class	-	-	-	-	42	25.30
2 nd and 3 rd class	-	-	-	-	1	0.60
First three years	-	-	-	-	9	5.42
3 rd and 4 th class	13	9.16	2	1.6	-	-
Throughout the student’s education	17	11.97	35	28	35	21.09
Never given	11	7.75	8	6.4	9	5.42
No opinion	8	5.63	7	5.6	3	1.81
Total	142	100	125	100	166	100

Table 5: Findings for the Question “To what extent Latin should be given to increase the success of biology and medical students?”

Answers	Biology Teaching		Faculty of Veterinary		Faculty of Medicine	
	f	%	f	%	f	%
Basic words (intermediate)	102	77.27	73	72.28	110	65.09
From less to more	9	6.82	3	2.97	-	-
At maximum level	21	15.91	8	7.92	28	16.57
Latin should not be given	-	-	11	10.89	10	5.92
Present system is good	-	-	4	3.96	6	3.55
With international criterions	-	-	2	1.98	1	0.59
No opinion	-	-	-	-	14	8.28
Total	132	100	101	100	169	100

- M23: “The words we learn are easily forgotten. Especially this anatomy lecture is very difficult. While saying words, I think what it is. I desire that a more effective learning technique should be found.”
- V85: “I can learn more easily if the meanings of Latin words are also taught, I do not memorize, I make reasoning.”

The students expressed various opinions regarding learning Latin terminology before lectures. The majority of students believed that Latin terminology should be presented before lectures, although a few students indicated that they could be taught during lectures, or be taught instead of the English preparatory class (Table 3). The students of all three faculties thought that it’s necessary for Latin terminology to be learned before

lectures. The opinions of some students related with this question are as follows:

- M83: “It is better to teach most frequently used terms. However, its grammer should not be taught.”
- M72: “The materials that will be helpful for Latin terminology aimed at anatomy and for computer-aided pronunciation in the first class should be presented.”

The answers for the question related with in which class (or classes) Latin should be presented were in the way that it should be given in the first and last years and it should be taken throughout the student’s education. Among these answers, students of all three faculties answered it as it should be given in the 1st class.

Secondly, Biology Teaching students answered as throughout the student's education, Faculty of Veterinary students answered as preparatory class and Faculty of Medicine students answered this question as it should be taken in the 1st and 2nd classes. The opinions of some students related with this question are as follows:

- M65: "When anatomy starts, it should start, it should continue on parallel to lectures."
- M84: "I it will be given as a lecture, it should be given in the first year of education. Later on, in any case, it's learned and understood as it's needed parallel to lectures."

The answers of students for the question related with to what extent Latin should be given to increase the success of biology and medical students were given in the way that it should be given as basic words, from less to more, at maximum level, Latin should not be given, present system is good, it should be with international criterions and no opinion. The students of all three faculties agreed on giving basic concepts with their Turkish equivalents. As a second answer, Biology Teaching students and Faculty of Medicine students answered as it should be at maximum level. Faculty of Veterinary students secondly answered this question as it should never be given. The opinions of some students related with this question are as follows:

- M45: "It should be given at a level that we can use in our education."
- M109: "It should be given at maximum level so that it's possible to get along with every nation at international level."
- V73: "As maximum as it can be. Because it's required to search for different references."
- B92: "Whole of Latin should be given at a level of word information level not as grammer, language structure, sentence structure."

The answers of students for the question related with whether biology and medical education can be without Latin terminology were in the way that it can't be, it can be, partially and no opinion. The students of all three faculties answered it as it can't be with high rates. The opinions of some students related with this question are as follows:

- B67: "It can't be. Because, Latin is the scientific language."
- B77: "Yes, it can be. The things we learned may be more permanent. Latin is forgotten when learned."
- V95: "Science is universal. It's possible to protect our occupational validity by knowing the language of science."
- M146: "It might be difficult to find Turkish equivalents of terms. Latin terminology and English are necessary in order to follow developments in world health."

Table 6: Findings for the Question "Can biology and medical education be without Latin terminology?"

Answers	Biology Teaching		Faculty of Veterinary		Faculty of Medicine	
	f	%	f	%	f	%
It can't be	100	70.42	64	55.17	128	73.56
It can be	35	24.65	43	37.07	34	19.54
No opinion	7	4.93	9	7.76	7	4.02
Partially	-	-	-	-	5	2.88
Total	142	100	116	100	174	100

Table 7: Findings for the Question "What do you think about the effect of knowing English on learning biology and medical terminology?"

Answers	Biology Teaching		Faculty of Veterinary		Faculty of Medicine	
	f	%	f	%	f	%
No effect	41	28.87	59	51.75	26	14.94
Little effect	16	11.27	10	8.77	37	21.26
Big effect	71	50.00	37	32.46	94	54.02
No opinion	14	9.86	8	7.02	17	9.78
Total	142	100	114	100	174	100

Table 8: Findings for the Question “What methods of study do you use to learn Latin words?”

Answers	Biology Teaching		Faculty of Veterinary		Faculty of Medicine	
	f	%	f	%	f	%
By writing	54	34.40	26	20.64	28	12.90
Together with Turkish meanings	11	7.00	16	12.70	42	19.36
Memorizing	24	15.29	23	18.25	52	23.96
Simile	12	7.64	15	11.91	6	2.77
By aloud redoing	14	8.92	34	26.99	49	22.58
By listening in lectures	-	-	3	2.38	5	2.30
According to the roots of words	4	2.55	1	0.79	-	-
Internet	1	0.64	1	0.79	6	2.77
By coding	35	22.29	-	-	4	1.84
By using in daily life	2	1.27	-	-	-	-
By working on figures	-	-	6	4.76	6	2.77
Question-answer	-	-	1	0.79	1	0.46
Correlating with English	-	-	-	-	1	0.46
No answer--	-	-	-	-	17	7.83
Total	157	100	126	100	217	100

The answers of students for the question related with the effect of knowing English on learning biology and medical terminology were given in the way that; no effect, little effect, big effect and no opinion. Biology Teaching students Faculty of Medicine students stated that it has big effect. Faculty of Veterinary students, on the other hand, thought that it has no effect. The opinions of some students related with this question are as follows:

- M21: “Since terms have same roots, they may have similar spelling or pronunciation. This provides simplicity in learning.”
- B51: “Some words evoke since they have English origin. This provides simplicity in learning the word.”

The answers of students for the question related with the methods of studying while learning Latin words were given in the way that; by writing, together with Turkish meanings, memorizing, simile, aloud redoing, listening in lectures, according to the roots of words, internet, coding, using in daily life, working on figures, question answer, correlating with English and no answer. It was determined that Biology Teaching students preferred at most by writing, Faculty of Veterinary students preferred at most by aloud redoing and Faculty of Medicine students preferred memorizing method. As a second answer, it was indicated that Biology Teaching students studied by coding, Faculty of Veterinary students studied by writing and Faculty of Medicine students studied by aloud redoing. The opinions of some students related with this question are as follows:

- B67: “I prepare study cards. I write Latin word on one side of card and its Turkish name on the other side.”
- B102: “Memorizing and writing. However, it slips in my mind after exams. I think Latin is inevitable for it to be permanent.”
- B66: “Since I know English, I make simile and codings. Sometimes, I prefer learning by writing.”

A Neolatin proverb saying “Invia est in medicina via sine lingua Latina.” (Latin is a must for drug) indicates the necessity and validity of Latin terminology education for faculties of medicine[18]. The aim of Latin terminology education is to provide accurate, practical medicine terminology in terms of grammar for students and medical specialists of the future [7].

The importance of Latin in science and medical fields is inevitable. For this reason, it’s necessary to emphasize on difficulties of Latin education and thus to concentrate on how to simplify learning of an unknown with an unknown language. This study was performed in order to determine the opinions of students in Biology Teaching, Faculty of Veterinary and Faculty of Medicine related with Latin terminology. In the study, it was tried to emphasize on difficulties, necessity of Latin and strategies followed by the students for learning. According to the findings; students had difficulty in learning Latin words used in lectures and it can be indicated that the students had difficulties originating from Latin. It was determined that the students in the study have at most difficulty in pronunciation and memorizing. According to Ausubel [19], meaningful learning is realized as a result of

configuring information by building one another, that is, a permanent learning is provided by correlating the words given in hierarchy with the previous ones. In this study, students indicated that they learned by memorizing and had difficulty in the pronunciation of Latin terminology. As a result, it was determined from the opinions of students that university students had difficulty due to terminology. It was stated by Tekkaya *et al.* [17] that the students at high school had also difficulty in biology subjects due to terminology.

According to the results of this study, the following opinions were determined: students thought that a biology and medical education cannot be without Latin terminology. It's necessary to give an education related with it absolutely before lectures. It's also necessary to give Latin terminology at basic level and this education should be given in the 1st class.

Biology students should use terminology in understanding significant scientific content and principles and in following and learning scientific literature or developments [16]. It's certain that the students in health sciences especially in Faculties of Medicine and Veterinary together with School of Nursing and Health Faculty will need terminology related with their subjects in the first years of education. Latin words and structures learned by health science students in the first years of their education which they will use intensively both in their studentship years and in all their profession will provide convenience [15].

In the study of Brahler and Walker [18], mnemonic strategy was developed by using meaningless assembly technique and it was focused on scientific and medical terminology education. This study tests the effect of suggesting meaningless word in back evoking Greek and Latin word roots that scientific terminology includes. Meaningless suggesting is a period called Medical Terminology Cs 350 and is an effective way in developing and simplifying back evoking. Because, this tool provides effective connection of new material to the present information structure and known assemblies. In this study, 3 groups were formed in anatomy and physiology lectures for high school students at a career technology center in order to investigate the effect of this technique. Medical Cs Terminology 350 was applied to the 1st group, remembering by memorization was applied to the 2nd group and both techniques were applied to the 3rd group. As a result of pre-and post-tests, it was determined that the group which was applied Medical Cs Terminology 350 was significantly more successful than other two groups.

In conclusion, science and medical fields cannot be considered without Latin. However, learning an unknown with a known is difficult. Latin terminology should be allowed for these scientific fields due to its difficulties in education period. However, Latin terminology can be given before lectures at a level that it might help only the content of lecture. Information related with roots, spelling and pronunciation of Latin words in lectures can be given. This can be at a level that it helps in lectures rather than learning a language. Developing new techniques to teach Latin terminology more easily may simplify learning period of an unknown with a known as mentioned before. These techniques will save Latin, which is the tool of science not aim of it, from complicating the lectures and will provide more permanent and meaningful learning.

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