Motivation versus age variable in secondary-school learners of English language

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Abstract:

Motivation is probably the most important factor for successful learning of any kind. This paper will attempt to explore the process of motivation for English language learning in secondary school learners considering the variable of age - its application or lack of it through the learning process itself, relevant factors which affect students, teacher’s role, the influence of parents, peers, and the environment, and to prove the hypotheses that a) motivation changes and decreases with the change of age in secondary school learners; and b) extrinsic motivation is more present than intrinsic motivation at secondary school level. This research problem will be examined through the method of questionnaire on the sample of 100 respondents – secondary school students (from first grade up to the fourth grade) of High Commercial School in Travnik. The paper will also attempt to discuss the types of motivation, types of learners, learners’ age, environment etc. and other learners’ variables, both through the recent theoretical studies regarding motivation in general (a detailed description of sources, characteristics and types of motivation), and, also, it will try to present a practical sample research of a decrease in motivation that starts at the upper-primary level and tends to decrease through the secondary level.

Key words: Motivation, extrinsic motivation, intrinsic motivation, language learners, age variable

1. Introduction

Motivation is a key factor in learning process of any kind, and it is certainly one of the main factors that affect Second Language Acquisition (SLA). It is no wonder, therefore, that many studies have been dedicated to the exploration of the issue of motivation, its origins and classifications, as well as to the means and ways of improving it within the classroom. As Jeremy Harmer (2001) puts it, “at its most basic level, motivation is some kind of internal drive which pushes someone to do things in order to achieve something.” (p. 51).

Since motivation is obviously an important concept, particularly in language learning (since this aspect is the major concern of this paper) it seems only logical and sensible to strive to the further understanding of this concept. There have been many practical studies reported on the research of motivation and its practical implementation amongst language learners of various age, but, again, it is the opinion of the author of this paper, that an important concept such as this one needs to be constantly researched in the light of modern developments in the field.
1.1. Objectives of the study

This paper will attempt to explore the process of motivation for English language learning in secondary school learners. We will discuss types and sources of motivation, characteristics of good learners, the variable of learners’ age, environment, peers, siblings and parents, teacher’s influence, as well as other learners’ variables that relate to extrinsic motivation, as well as the variables of intrinsic motivation in the recent theoretical studies; and also, we will attempt to prove our hypothesis that the age variable has a major impact on the change and decrease of motivation in secondary school learners, as well as the hypothesis that extrinsic motivation and its incitements in the classroom are more present amongst these learners than the intrinsic incitements.

1.2. Research questions and hypotheses

As previously stated, we will attempt to research motivation for English language learning amongst secondary school learners, considering the variable of age, as well as the importance of extrinsic motivation over intrinsic motivation. The paper will attempt to answer the two key questions considered here:

a) Motivation changes and decreases with the change of age in secondary school learners;

b) Extrinsic motivation is more present than intrinsic motivation at secondary school level learners.

1.3. Scope of the study

The study was conducted with the samples selected from the first, second, third and fourth grade of students of High Commercial School in Travnik, to explore the variation in motivation and to explore the dominant motivation in their English language learning. The data for this study was obtained through the questionnaire administered to the total number of 100 students. Identifying the change and decrease of motivation with the change of age, we may be able to formulate measures for improvement of their learning motivation, for the purposes of better learning success. Their type of motivation could be identified at this first point to assist them through their successful path of learning English.

2. Review of Literature

2.1. What is motivation?

There are many different definitions of motivation, especially in language learning. And it is no wonder, since we have already ascertained the importance of the concept for any type of
successful learning, including language learning. In addition to the previously cited Harmer’s definition of motivation being a “some sort of internal drive”, Marion Williams and Richard Burden suggest that motivation is a “state of cognitive arousal” which provokes a “decision to act” as a result of which there is “sustained intellectual and/or physical effort” so that the person can achieve some “previously set goal” (Harmer, 2001, p.51).

Gardner (1985), in his socio-educational model, notes that “motivation is perceived to be composed of three elements…. effort, desire, and affect” (p.10-11) (effort being the time spent studying the language and the drive of the learner; desire indicating how much the learner wants to become proficient in the language; and, finally, affect meaning the learner’s emotional reactions related to language study). Penny Ur (2002), however, believes that the abstract term “motivation” on its own is rather difficult to define, therefore she stipulates that “it is easier and more useful to think in terms of the “motivated” learner: one who is willing or even eager to invest effort in learning activities and to progress. (p. 274)

2.2. Sources of motivation

Now that we have attempted to answer the question of what motivation is, we need to ask ourselves the following: where does it come from, namely, what are the sources of motivation? As Jeremy Harmer (2001) argues, “the motivation that brings students to the task of learning English can be affected and influenced by the attitude of a number of people.” (p. 51). He further offers several sources of motivation: the society we live in; significant others; the teacher; and the method.

2.3. What makes a good learner?

When it comes to discussing the features or characteristics of good or successful learner, many studies have been conducted in this field as well. Neil Naiman and his colleagues, in a classic study of successful language learning, came to the conclusion that the most successful learners are not necessarily those to whom a language comes very easily (Ur, 2002, p. 275). They included several areas, or typical characteristics that successful learners display, including: positive task orientation; ego-involvement; high aspirations; goal orientation; perseverance and tolerance of ambiguity.

Now that we know what makes a good or successful learner, we will dedicate the following chapter of this paper to investigating the variable of learners’ age, with the special focus on the adolescents (secondary school students), since this variable is of the key interest to this study. Next, the following chapters will further discuss the types of motivation in general, with the special attention to the features of extrinsic and intrinsic motivation, these being, again, of the key interest to this study.

2.4. The variable of learners’ age
The effects of age on SLA have been often investigated by different scholars in the field of Second Language Acquisition, and many debates have covered this particular issue. And no wonder, since it is most certainly a major factor in making decisions on how to teach and what to teach – because, obviously, “people of different ages have different needs, competences, and cognitive skills; we might expect children of primary age to acquire much of a foreign language through play, for example, whereas for adults we can reasonably expect a greater use of abstract thought.” (Harmer, 2001, p.37)

The main focus of this particular study is to try to find out the age effect on English language learning amongst secondary school learners, where we will try to prove that motivation changes and decreases with the change of age, as Steven Pinker (1994) points it out, “acquisition of a normal language is guaranteed for children up to the age of six, is steadily compromised from then until shortly after puberty, and is rare thereafter”; and further continues to argue that, “language-learning circuitry of the brain is more plastic in childhood” (p. 293). This is only one of commonly held views about the variable of age in SLA, where majority of scholars believe that children learn languages faster than adults do. Also, Muriel Saville-Troike (2006) argues that there is a “critical period” for first language acquisition, where children have only a limited number of years when normal acquisition is possible, and that, after this period, brain loses its plasticity (p. 82).

However, Penny Ur (2002) argues that “given the same amount of exposure to a foreign language, there is some evidence that the older the child the more effectively he or she learns”, and she additionally asserts that “probably teenagers are overall the best learners” (p. 286). She continues to argue that teenagers have greater learning potential than young children, however, it is much more difficult to motivate and manage them. Additionally, Jeremy Harmer (2001) says that “teenagers, if they are engaged, have a great capacity to learn, a great potential for creativity, and a passionate commitment to things which interest them”, and, that it is teacher’s job to “provoke student engagement with material which is relevant and involving” (p. 39).

When we consider those aforementioned arguments which state that teenagers are, in fact, the best learners, it inevitably raises the question of why are adolescents often difficult to manage, disruptive in class and unmotivated to learn foreign languages? Perhaps one of the reasons lies in the fact that adolescence is the period of “the search for individual identity….which has to be forged among classmates and friends; peer approval may be considerably more important for the student….“(Harmer, 2001, p. 39). Perhaps it also has something to do with the mere boredom they feel, or the problems they bring to class from outside school. Whatever the reasons may be, this paper will attempt to find out what are some of the key motivational factors amongst teenage English language learners, and also to find out to what extent their motivation changes and decreases as they progress through secondary school and grow older.

2.5. Types of motivation
Since the objective of this paper is to investigate the factors that influence secondary school learners’ English language learning, including the change in motivation through their age, in the following paragraphs we will discuss the accepted distinctions of motivation.

There have been several distinctions of motivation made in the literature; the first one being between “integrative” (an interest in learning second language due to learning about or associating with the people who use it - emotional or affective factors have a great deal) and “instrumental” (involves concepts of purely practical value in learning second language in order to increase learners’ career or business opportunities) motivation (Saville-Troike, 2006, p. 86). Additionally, Stephen D Krashen (2002) claims that “for the integratively motivated performer, interaction for its own sake will be valued… (whereas) for the instrumentally motivated performer, interaction always has some practical purpose.”

The second major distinction, or classification of motivation, (and perhaps more useful one for teachers) is the one between “extrinsic” and “intrinsic” motivation (Ur, 2002, p. 276). Since this paper is primarily concerned with this classification of motivation, we shall further look into the features of these two types of motivation in the following chapters.

2.6. Extrinsic motivation – features

As the name itself says it, it is a type of motivation which is derived from the influence of some kind of external incentive. As Jeremy Harmer (2007) puts it, this kind of motivation “comes from outside the classroom and may be influenced by a number of external factors such as the attitude of society, family and peers” (p.20), and continues on to saying that (2001) “it is caused by any number of outside factors, for example, the need to pass an exam, the hope of financial reward, or the possibility of future travel” (p. 51). So, as we can see, actually both integrative and instrumental motivations are hereby grouped under the branch of the extrinsic motivation.

Since it involves incentives that are brought into the classroom from outside, most of these are inaccessible to the teacher’s influence. There are, however, other external sources that are directly affected by the teacher, and some of them include success and its rewards (a desire to get a reward and avoid punishment); failure and its penalties; authoritative demands (teacher pressure); and tests and competition (to beat their opponents) (Ur, 2002, p. 277-279). Finally, we could say that “extrinsic motivation comes from the desire to get a reward or avoid punishment” (Arnold, 2000, p. 14), however, especially for long-term retention; Arnold argues that learning is most favourably influenced by intrinsic incitements. Majority of schools, it seems, encourage only extrinsic motivation through their emphasis on teacher-directed classroom, grades, tests and competitiveness, and this leads students to work to please teachers or authorities, rather than to develop a love of knowledge in independent minds. In our research, we will try to prove that secondary school learners are generally more motivated extrinsically, than intrinsically, and we will try to find out which of the extrinsic incitements have the major influence on the second language learning.
2.7. Intrinsic motivation – features

Intrinsic motivation arises from within the individual, which is the urge to engage in the learning activity for its own sake, and is associated with what has been termed “cognitive drive” (Ur, 2002, p. 276) – the urge to learn for its own sake, which is very typical of young children and tends to deteriorate with age. Also, intrinsically motivated person enjoys the learning process itself or desires to make himself/herself feel better. What most researchers and methodologists have come to understand is that “intrinsic motivation is especially important for encouraging success” (Harmer, 2001, p. 51). Besides the desire to learn for the sake of learning itself, Jeremy Harmer (2007) says that intrinsic motivation can occur within the classroom as well in the sense that “it is generated by what happens inside the classroom; this could be the teacher’s methods, the activities that students take part in, or their perception of their success or failure” (p. 20).

As Jane Arnold (2000) puts it, “with intrinsic motivation the learning experience is its own reward” (p. 14), and, as already mentioned, intrinsic motivation is better for long-term retention, where language learners will succeed better when intrinsic forms of motivation are developed, in which they learn for their own personal reasons of achieving competence and autonomy. In this paper we will try to prove that the level of intrinsic motivation within secondary school English language learners does, in fact, deteriorate with age, and that it is far less present than extrinsic motivation.

3. Research Methodology

3.1. Participants

The research problem will be examined on the sample of 100 respondents – secondary school students that will include students from first grade up to the fourth grade of High Commercial School in Travnik. The selected sample has the following features:

- Total number of respondents is 100 students of High Commercial School in Travnik – economic technician.
- The sample includes first grade, second grade, third grade and fourth grade students
- Male – female ratio is 43-57.

3.2. Research instrument

The data for the study will be obtained through the method of questionnaire (a 5 point Likert Scale which was adapted from the original 7-point Likert Scale format of Gardner’s Attitude/Motivation Test Battery (AMI), ranged from “Strongly Agree” to “Strongly Disagree” (Gardner, 1985, p. 177). Additionally, in order to process attained data, we will use
exploratory research, descriptive statistics, calculation of questionnaire results, as well as the
analysis and synthesis, all for the purposes of reaching conclusive data that would support our
research objectives and in the end prove our research hypotheses. Data gained in the
questionnaire method will be processed by descriptive statistics: calculation of percentages,
frequencies and graphic representations of gained data.

There were 24 questions in the questionnaire. The questionnaire was composed of two
main parts: the existence and variation (change) and the fluctuation in motivation (items 1-4)
and the factors of extrinsic and intrinsic motivation (items 1-20). The questionnaire format
consists of the following parts:

**Part 1:** General demographic information of students: sex and age (grade).

**Part 2:** Students’ motivation variation – the change and decrease in motivation with
the change of age in secondary school learners; as well as the fluctuation in
motivation – the older the students (grade), the more they preferred learning
English in lower grades (when younger).

**Part 3:** Factors of extrinsic and intrinsic motivation in secondary school level learners’
motivation for the purposes of determining the presence of both types of
motivation and larger significance of extrinsic motivation over intrinsic; also,
to determine which extrinsic motivation factors are more significant.

### 4. Findings

The findings of the study were divided into three main parts: (1.a.) Students’ motivation
variation – the change and decrease in motivation with the change of age in secondary school
learners; (1.b.) fluctuation in students’ motivation – the older the students, the larger
preference for learning English in lower grades; (2) factors of extrinsic motivation
(subdivided into three subgroups); and (3) factors of intrinsic motivation.

**4.1. The level of students’ motivation and variation in motivation; the fluctuation in
students’ motivation according to their age**

This part of the research represents the level of motivation of secondary school English
language learners, starting from first grade up to the fourth grade. As we can see, motivation
significantly varies with the change in age of students. First graders have the highest level of
motivation (64%), which significantly drops in second grade (only 28%), then rises up in
third grade again (44%), and falls once more in fourth grade (38%). From the findings, it is
safe to say that motivation for English language learning does in fact changes and decreases
with the change of age in secondary school learners. Graph 1 shows the change in motivation:
The second issue examined in this part of the research dealt with the fluctuation in students’ motivation in learning English. The questionnaire examined the fluctuation in motivation in relation to the change of students’ age – the students preferred learning English more in lower grades. First grade students had 30% of positive answers regarding the fluctuation of motivation (which is acceptable, since they demonstrated the highest level of motivation); second grade students had 46% of positive answers (which corresponds to the drop in motivation from the first part); third grade students had 42% of positive answers (again, corresponding to the slight rise in motivation); and, finally, fourth grade students had 32% of positive answers (which corresponds to yet another drop in motivation). Graph 2 shows the fluctuation in motivation:

Graph 1 The level of motivation

Graph 2 Fluctuation in motivation in relation to the change of students' age
From the presented findings, it is possible to conclude that the motivation for learning English does in fact change and decreases with the change of students’ age, which is additionally supported by the fluctuation in motivation in relation to the change of students’ age. Therefore, we can conclude that our first hypothesis has been proven true.

4.2. Factors of extrinsic motivation

This part of research was concerned with the presence of extrinsic motivation in secondary school English language learners and the fact that extrinsic motivation is more present than intrinsic motivation. The questionnaire was divided into three subgroups of factors that constitute extrinsic motivation: factors outside of classroom; integrative/instrumental motivation; and factors in the classroom. Here we tried to find out not only the superiority of extrinsic over intrinsic motivation in students, but also to see which extrinsic factors constitute the most important incitements in English language learning. Due to the principle of the economy, we will demonstrate detailed results for factors that highly influence students’ extrinsic motivation; whereas those factors that do not contribute significantly will be abbreviated.

The first subgroup of factors (outside of classroom) concerned positive attitudes of the environment, of parents and siblings regarding learning English. Picture 1 shows the total percentage of positive attitude of the environment towards learning English for all grades (from first to fourth), where, as we can see, 50% of students responded positively to the attitude of the environment towards learning English, which means that students consider this to be a major factor in their learning:

![Pie chart showing the percentage of positive, neutral, and negative attitudes of the environment](attachment://picture1.png)

Picture1 The total percentage of positive attitude of the environment (1st – 4th grade)
Next factor in the questionnaire considered positive attitudes of parents and siblings regarding learning English. Picture 2 shows the total percentage of positive attitude of parents and siblings towards learning English for all grades (from first to fourth):

**Picture 2** The total percentage of positive attitude of parents and siblings (1st – 4th grade)

Here, 86.5% of students responded positively to the question of positive attitude of parents and siblings towards learning English, which also means that this is a factor that students feel has a major importance for their studies.

To summarize the results, we believe it is plausible to say that secondary school students are motivated outside the classroom by both the environment and their parents and siblings, the latter being stronger motivational source (over 80%), whereas the influence of the former is also significant (50%). In this part of the questionnaire, we can conclude that the factors of extrinsic motivation outside of the classroom are strongly present in the overall students’ motivation in learning English.

The second subgroup of factors (integrative/instrumental motivation) concerned the issues of integrative motivation (learns English to understand English books, music, movies etc.; learns English to make new English-speaking friends); and the issues of instrumental motivation (learns English to get a better job in the future; learns English for travelling abroad). From the results of the questionnaire, it is plausible to conclude that students are highly motivated by both integrative and instrumental factors, former being slightly more expressed in their motivation.
Picture 3 shows the total percentage of integrative motivation factors that influence students’ motivation towards learning English for all grades (from first to fourth), where we can see that 87% of students answered positively to the questions regarding integrative motivation factors, which means that they perceive the importance of learning English in order to integrate into and better understand English-speaking communities. We can conclude that integrative motivation also constitutes a major factor in learning English amongst secondary school learners:

Picture 3 The total percentage of integrative motivation factors (1st – 4th grade)

Picture 4 shows the total percentage of instrumental motivation factors that influence students’ motivation towards learning English for all grades (from first to fourth):
The total percentage of instrumental motivation factors (1st – 4th grade)

Here, 84% of students responded positively to the questions regarding instrumental motivation factors, which again means that they understand the importance of learning (and knowing) English for their future careers, travel and various skills and knowledge. Once more, we can say that instrumental motivation contributes significantly to the overall extrinsic motivation in learning English amongst secondary school learners.

Again, in order to summarize the results, we can say that students are highly motivated by both instrumental and integrative motivation factors, and that these factors contribute highly to their “drive” to learn English. In this part of the questionnaire, we believe it is plausible to conclude that instrumental and integrative factors of extrinsic motivation are also strongly present in the overall students’ motivation in learning English.

Finally, the third subgroup of factors (factors in the classroom) concerned the issues of peer influence (positive attitude of peers; mockery of peers; competition amongst peers); teacher’s attitude (positive attitude of teacher towards the subject; teacher’s strict demands); learning only for mark/test; and, finally, learning because of interesting learning materials (the materials are up to date, adopted to teenagers’ interests etc.). From the results of the questionnaire, it is plausible to conclude that students are, in the classroom, mostly motivated by the teacher’s attitude and by their marks, whereas other factors in the classroom do exist, but do not seem to contribute highly to the level of students’ extrinsic motivation.

As we can see, Picture 5 shows the total percentage of peer influence regarding their positive attitudes towards learning English; the unwillingness of students to participate in English classes due to the fear of peer mockery, and, finally, competition amongst peers as an extrinsic incitement for students:
So, when it comes to the peer influence, according to the results of the questionnaire, we can conclude that it does exist as a motivational factor within the classroom, but, it is not the one of major significance to secondary school English learners.

The second factor within the classroom that influences students’ extrinsic motivation was related to learning because of interesting learning materials (that are up to date, interesting, adopted to teenagers’ interests etc.). Once more, students did acknowledge the existence of this factor, but once more did not feel it to be of any significant importance towards their extrinsic motivation. Picture 6 shows the total percentage of the influence of learning materials:

**Picture 5 The total percentage of peer influence (positive attitude; mockery; competition) (1st – 4th grade)**
Up to this point of the results, it is plausible to conclude that students do recognize the factors of peer influence and of learning materials, but that they do not feel these factors have any major impact onto their extrinsic motivation for learning of English in classroom. Therefore, it is safe to say that these factors do not contribute significantly to students’ extrinsic motivation. However, the following two factors – teacher’s attitude and demands, as well as their marks – do quite significantly influence their motivation within the classroom.

First, we will look at the importance of teacher as being a major factor in student’s motivation. In the questionnaire, the students were asked about teacher’s positive attitude towards the subject, and if they felt that such attitude helps and motivates them to study more; and, secondly, they were asked about the influence of teacher’s strict demands on their motivation. Picture 7 demonstrates the results for all grades regarding teacher’s positive attitude towards the subject; andas we can see from the results, 69% of students felt that teacher’s positive attitude towards the subject significantly influences their motivation to learn English.
The total percentage of teacher’s positive attitude towards the subject (1st – 4th grade)

Second, the students were asked about the influence of teacher’s strict demands as a motivational factor, and to what extent did such demands motivate them to learn English. Picture 8 shows the results for all grades regarding teacher’s strict demands:

Picture 7 The total percentage of teacher’s positive attitude towards the subject (1st – 4th grade)

Picture 8 The total percentage of teacher’s strict demands influencing students’ motivation (1st – 4th grade)
As we can see from the results, 44% of students responded positively to the issue of teacher’s strict demands as a factor that influences their own motivation.

To summarize the results, the influence of the teacher on students’ motivation is more than evident within the classroom. However, students feel that they are more motivated by the teacher’s positive attitude towards the subject, than by the teacher’s strict demands, even though they recognize this as an influential factor as well.

Finally, the last significant extrinsic factor within the classroom is students’ marks. In the questionnaire, the students were asked if they learnt English only for their marks, or when they have tests, and the total results, shown in Picture 9, are as follows:

![Marks/Tests Chart]

**Picture 9 The total percentage of students' motivation to learn due to marks or tests (1st – 4th grade)**

Here, as the results demonstrate, 54,50% of students are motivated by their marks, meaning that they study in order to get a good (or better) mark (tests included).

According to the results of the questionnaire, we believe it is plausible to conclude that secondary school students are highly motivated extrinsically. As we said earlier, the objective of this paper is to try to ascertain that this age group is motivated extrinsically more than intrinsically, but also, to try to ascertain which extrinsic factors are more relevant for secondary school learners.

From the results of our questionnaire, we can say that students are motivated a) outside the classroom more by their parents and siblings than by their environment; b) they are also highly motivated by instrumental and integrative factors; and c) within the classroom they are mostly motivated by their teacher’s attitude and their marks. From all of the above,
we feel it is safe to conclude that our hypothesis on the level of presence of extrinsic motivation is hereby proven true.

The final part of this paper (and of the questionnaire itself) deals with the existence and the level of presence of intrinsic motivation amongst secondary school learners of English. Here, we will try to prove our hypothesis that secondary school students are more motivated extrinsically than intrinsically. The students were asked questions typically assigned to the factors of intrinsic motivation (learning for the pleasure of learning itself; because learning makes me feel good; because I can discover new languages; because I can improve my skills and knowledge etc.), and the results, displayed in Picture 10, are as follows:

![Intrinsic motivation](image)

**Picture 10 The total percentage of students' intrinsic motivation (1st grade – 4th grade)**

As we can see, only 46.00% of the total sample of students is motivated intrinsically, which is significantly lower percentage than the factors of their extrinsic motivation.

According to the results of our questionnaire, we can say that students are less motivated intrinsically than extrinsically and therefore it is plausible to say that our hypothesis that extrinsic motivation is more present than intrinsic motivation at secondary school learners is hereby proven true.

5. **Discussion and Recommendations**

The overall results reveal that the students’ motivation does in fact change with the change of their age, which answers the research question of what the level of students’ motivation is per each grade. Based on the comparison and assessment of the results, we have
discovered that students are more strongly motivated to learn English by the factors of extrinsic motivation, than by the factors of intrinsic motivation, which also answers our question of higher presence of extrinsic motivation over the intrinsic one.

Based on the findings of this study, the results are unique for these particular aimed groups of students, and the study of students in other schools or institutions with largely different context may yield significantly different results. Future research should also include more and various schools and institutions. Additionally, this research obtained the data from 100 students, where we included one class of each grade only, and is therefore recommended that future studies use a larger sample size in order to increase the degree of generalization of the study, and in order to make the findings more valid and reliable.

6. Conclusion

As the motivation to learn English is one of the most important learning factors, the need to determine the actual motivational situations of any students’ group is worthwhile. This is for the benefit of their language-learning effectiveness and proficiency. In conclusion, this study was conducted to provide some insight into the level and type of motivation of students in High Commercial School in Travnik. Although the data source of the study may not represent all other student groups, the author of the paper is still confident that the results will give a relative representation and be of a great value to authorities or researchers concerned.

References:

I Books and Articles


II Electronic Sources