

A Comparative Analysis of Science and Arts Students' Performance in CET Band 4 and Its Pedagogical Implications

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Abstract

The present research, taking Science and Arts students from respectively three typical Science and Arts schools of Shanxi Normal University as an example, is intended to make a contrastive examination of Science and Arts students' CET Band 4 performance and attempt to find out how the two groups of students differ from each other in their respective performance in the three parts of the test including listening, reading and writing, and finally discuss the possible reasons. It is revealed that Arts students' overall performance in the parts of listening, writing is better than that of Science students, meanwhile Science students manifest better reading performance than Arts students. Due to the differences in majors and expertise, Science and Arts students manifest much difference in such aspects as background knowledge, thinking patterns and learning strategy preference, etc. which may lead to their differences in CET Band 4 scores. Considering the differences between Science and Arts students in their learning styles, thinking patterns and learning strategy preference, etc., we propose some suggestions with the intention to help both Arts and Science students to overcome their respective weaknesses so as to improve their comprehensive language competence.

Key words: Science and Arts students; CET Band 4 performance; Learning strategies; Pedagogical implications

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1. INTRODUCTION

College English Test Band 4 (referred to as CET Band 4 thereafter) is a nationwide English test organized by the Higher Education Department of Ministry of Education, the purpose of which is to promote the implementation of the syllabus of college English teaching, and also to accurately and objectively test undergraduates' English language ability, including students' listening, speaking, reading, writing and translation ability. As a way to check students' comprehensive English ability, questions in CET Band 4 covers virtually all aspects concerning students' language ability, therefore, it is highly likely to reflect the real situation of every individual student's English language level both in understanding and application of English. By examination of students' CET scores, we can often find problems with English learning and teaching, therefore, for the recent years, many scholars have focused their research on CET Band 4 and 6 performance of learners at different levels, problems with Chinese English language learners and their teachers, and the possible reasons, and very often suggestions are proposed to improve both English language teaching and learning in China.

Previous research, to mention the major ones, has been done concerning the relationship between individual learner differences and their performance in CET Band 4, the differences between the top and the low students in their use of meta-cognitive strategies and vocabulary strategies, cognitive strategies and social / affective strategies and its implications for strategy-based instruction, science and arts students' overall mode of

vocabulary learning beliefs, learning motivation, the use of vocabulary learning strategies, vocabulary memory strategies, strategies and methods of vocabulary learning, differences between successful and unsuccessful English learners' learning methods, learning strategies and their relationship to learning achievement in listening comprehension, non-English majors' perceptual learning styles, etc. (Wen Qiu fang & Wang Haixiao, 1996; Wang Limei, 2008; Liang Ying, 2012; Qiu Shaoji, 2009, 2011; Zhang Shiyong, 2013, Wen Qiufang, 1995, Jiang Zukang, 1994, Yu Yan, 2009, etc.). It has been revealed by previous related studies that learner differences do make impact on students' CET performance, and that there do exist differences in the use of learning strategies and vocabulary learning strategies, between top and low students, and Science and Arts students. The present research is intended to make a contrastive analysis of science and arts students in their CET performance, attempting to find out how the two groups of students differ from each other in their respective performance and discuss the possible reasons, finally we will come up with some practical suggestions for both Science and Arts students to overcome the weakness while maintaining their established strength, suggestions for English teachers are also proposed. It is self-evident and widely believed that through careful examination of students' test scores in CET, we can often get a general understanding regarding how well have students commanded the English linguistic knowledge and how well can they use the language, what is their weaknesses and strengths in English learning, what language skills need further attention and efforts, etc. In view of this, this research taking CET scores of science and arts students from Shanxi Normal University, by examining the CET scores of science and arts students, is intended to answer the following three research questions:

(1) What is the major differences in the overall performance of science and arts students in their CET Band 4 scores?

(2) What are the possible reasons for such differences?

(3) What possible pedagogical implications can be proposed to improve Science and Arts students' performance in CET Band 4?

2. THEORETICAL BASIS

Beginning from 1970s, research interest and focus in the field of second language acquisition shifted from how to teach to how to learn, learning strategies of second and foreign language learners came to be the central concern of researchers abroad and at home. Researchers are getting more engaged in the classification, and gender and major differences in learning strategies, good learners' learning strategies. Around 40 years of previous research indicates that learning strategy and the ways of learning are the decisive and critical factors that can affect learning outcome (Zhang Shiyong, 2013), top and low students

differ in the use of learning strategies (1997), high and low achievers manifest much difference in their learning belief, the use of vocabulary learning strategies (Li Hengyu, 2013).

Language learning belief refers to their knowledge about different factors that affect language learning, about how to acquire language, language skills, and communicative competence. Yang (1999) identified learning belief as a kind of meta-cognitive knowledge, particularly referring to English language learners' preconceived thoughts, perceptions, attitude, views or opinions, etc, whereas Reliy (1996) regards learners' language learning beliefs as popular ideas about the nature, the structure, and the use of language, the relationship between thought and language, language and intelligence and so on. It has been proved that learners' belief about language learning and the use of learning strategies are inter-related, their belief can often determine what learning strategies they use.

Research on language learning strategy started with Carton in about mid-1960s, focusing on how language learners learn language. Up till now, researchers have not yet reached their consensus on the definition of learning strategies, some of the major definitions are listed by Ellis (1994) as below: Stern (1983) defines learning strategy as the general tendencies or characteristics of the learning approach employed by the second or foreign language learners, leaving techniques as the term to refer to particular forms of observable learning behavior; learning strategies are techniques, approaches or deliberate actions that students adopt in order to facilitate their learning, recall of both linguistic and content area information (Chamot, 1987); Oxford (1989) identifies language learning strategies as specific actions taken by the learners to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations; and learning strategies are also used to refer to the special thoughts or behaviors that individual learners make use of in order to help them comprehend, learn or retain new information of the language (O'Malley & Chamot, 2001).

Based on the information-processing model of learning, O'Malley and Chamot (2001) divided language learning strategies into three kinds including Meta-cognitive strategies, Cognitive strategies and Social/Affective strategies. Meta-cognitive strategies which are the higher-order executive strategies involve planning, selective-attention, self-monitoring, and self-evaluating; cognitive strategies are concerned with the mental processing in the process of language learning, including such strategies as dictionary use, note-taking, repetition, application, grouping, association, guessing, keyword, contextualization, translation and word-formation, etc. Social/affective strategies refer to ways or methods learners choose to communicate or interact with others, for example, cooperation, inquiring, and self-encouragement.

Language learning strategies are also divided into direct and indirect strategies according to the relationship between strategies and language material. Direct strategies directly involve the target language and require mental processing of the language input, meanwhile indirect strategies refer to the ones which provide external support for language learning indirectly by means of focusing, evaluation, seeking opportunities, controlling anxiety and other means(Oxford, 1990), direct strategies are further divided into memory strategies, compensation strategies and cognitive strategies while indirect ones include metacognitive strategies, affective strategies and social strategies. Cohen (2000) classified learning strategies into two kinds according to the purpose of strategy using which are language learning and language using strategies. The former ones refer to the strategies learners consciously apply when learning a second language including identifying the material for learning, distinguishing it from other learning, grouping it for easier learning, repeated exposure to the material and taking efforts to remember it; the latter ones refer to the strategies in language use including retrieval strategies, rehearsal strategies, cover strategies and communication strategies. In the present research, O'Malley and Chamot's classification of learning strategies is adopted since this kind of classification can well demonstrate the situation of the use of learning strategies students use in learning English.

Learners differ in the learning strategies from one to another, from one group to another. Some of the strategies facilitate English learning more than the others which are part of the possible reasons for their overall performance in CET and their performance in different parts. Top and low learner groups, Science and Arts students groups, male and female learner groups, groups from different ethnic background are proved to be different in their choice of learning strategies. Our discussions will mainly focus Science and Arts student learners' CET Band 4 performance.

3. DIFFERENCES IN SCIENCE AND ARTS STUDENTS' CET PERFORMANCE AND THE POSSIBLE REASONS

The present research chooses CET Band 4 scores in June 2012 of Science and Arts students from Shanxi Normal University. Visual Basic of software Excel is used to analyze the total scores and scores for the parts of listening, reading, and writing. The scores of 666 students from Arts schools and 832 students from Science schools are analyzed. Statistics indicate that differences exist in the average score of the two groups, to be more specific, the average score for Arts students is 439 while that for Science students is 432; secondly, differences exist in the number of students from the two groups in high score areas, to be more specific, there are more Arts students than Science students in high score areas, for

example, Arts students above 446 accounts for 46.1% of the Arts students in total, whereas Science students above 466 accounts for only 42.6% of the Science students in total; Arts students above 500 accounts for 15.6% of the total whereas Science students scoring higher than 500 accounts for only 12.4%. To summarize, Arts students do better than Science students both in average score and in high score areas, as indicated in Figure 3-1 below:

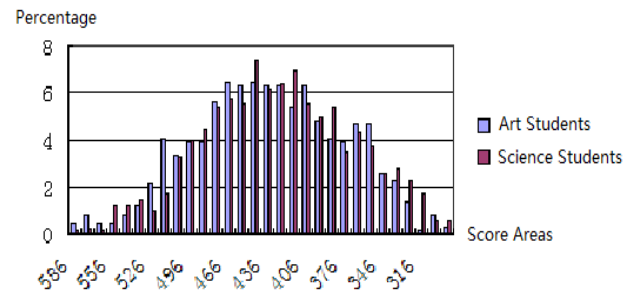


Figure 3-1
Distribution of Arts and Science Students in Different Score Areas

3.1 Comparative Analysis of Arts and Science Students' Listening Performance

CET Band 4 is composed of 4 parts which are listening, reading, writing and cloze, accounting for 35%, 35%, 20% and 10% of the total score. Figure 3-2 shows the percentage of the different score areas against the total score. It is found that in score areas beginning from 460 until 580, the percentage against the total score for Arts students is much higher than that for Science students, which seems to show that Arts students' listening ability is obviously better than Science students. Jiang Zukang (1994:52-53) remarks that there are seven factors that may affect listening performance including overall listening comprehension, listening for understanding factual information, listening for comprehension and interpretation, listening for detailed and selective information, listening for global ideas, listening for online tasks, and listening for retrospective tasks. In addition, researchers found that the use of learning strategy and effect of learning strategy are likely to be affected by the factor of learner variable, which include learners' language proficiency and learning environment(Jiang Zukang, 1994). Due to the major difference between Arts and Science students, the two groups of students differ in their background knowledge, Arts students may have more background knowledge concerning western culture, history, politics and society than science students, which may contribute to the better listening performance, as Jiang Zukang (1994) comments that rich background knowledge about the target language is very likely to facilitate the improvement of learners' listening ability. A careful examination of the listening material in CET Band 4 indicates that listening material tends to be more related to social life rather than to natural science. Besides as Arts students tend to have more time at their own disposal,

they may devote more time to the practice of their listening. As to the use of vocabulary memory strategies, Qiu Shaoji (2011) comments that the strategies of repetition, association, word-formation, grouping, context etc. work better for Arts students, since such learning strategies accord more with Arts students cognitive styles. The use of these strategies may more or less improve Arts students' language proficiency.

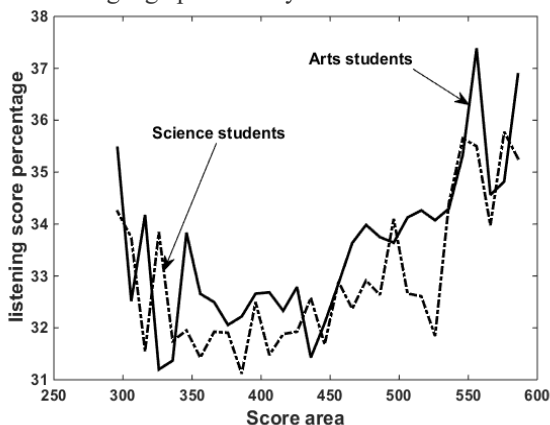


Figure 3-2
Distribution of Arts and Science Students' listening performance

3.2 Comparative Analysis of Arts and Science Students' Reading Performance

In this section, a comparative examination of Arts and Science students' reading performance is conducted. Statistic results reveal that for the score areas beginning from 360 until 585, the percentage of reading score against the total score for Science students is higher than that for Science students, particularly in the high score areas beginning from around 510, Science students' reading scores are much higher than that of the Arts students as shown in Figure 3-3 below. It is quite evident that Science students comparatively speaking do better in reading than Arts students. Science students' reading scores accounts for 37.6% of the total while that for Arts students is only 36.5%.

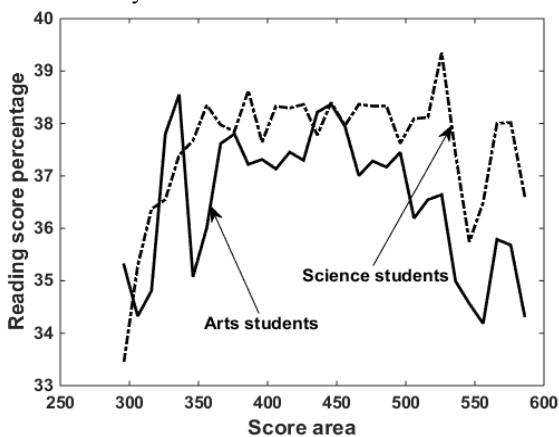


Figure 3-3
Distribution of Arts and Science Students' reading performance

It is generally believed that language learners build up their reading ability through various approaches, such as rote memory, context and use, etc. Compared with Arts students, Science students have stronger belief that vocabulary should be learned and acquired through use, which may be because that they do many experiments in their major study before they can acquire new knowledge. The similar finding is made by Yu Yan (2009), her research reveals that Science students prefer kinesthetic style in their foreign language learning compared with Arts students, which to a certain explains why the Science students believe that the vocabulary should be acquired through use more than Arts students. What the Science students believe implies that only when learners do large amount of practice, can they learn well. Science students tend to use guessing strategy when reading, which can improve learners' reading greatly as Rubin's research indicates. Rubin (1975)'s study about good language learners makes the following findings: 1) Good language learner may be a good guesser, that is, he gathers and stores information in an efficient manner so it can be easily retrieved. He may actively look for clues to meaning-in the topic, setting, or attitudes of the speakers. His guessing strategy may be stratified from the more general one to the specific one so that he gets the most information from each question or sentence. A good language learner is often, (2) willing to appear foolish in order to communicate and get his message across, and (3) will try out his knowledge by making up new sentences, thus bringing his newly acquired competence into use. Rubin's finding implies good learners often use guessing and often take positive attitude towards learning, take every opportunity possible to put what they have learned into use. Similarly, Li Hengshu's findings (2013) indicate top language learners take more initiative in their learning, very actively make their learning plans and learning process, at the same time they are also doing better in their use and practice of the target language. All these seem to account for why Science students can do better in their reading.

However, Arts students mostly hold that the most effective ways of learning and remembering vocabulary are dictionary use, repetition, rote memory, which may hinder and slow down their fast extensive reading efficiency, and lower their reading amount.

3.3 Comparative analysis of Arts and Science Students' Writing Performance

This section is concerned about the differences between Arts and Science students' performance in the part of writing. Figure 3-4 below shows percentage of writing score of Arts and Science Students against the total scores in different score areas, it is quite obvious that beginning from around the score 470, Arts students are doing better than their Science counterpart, typically the higher the

total score, the higher the writing score for Arts students.

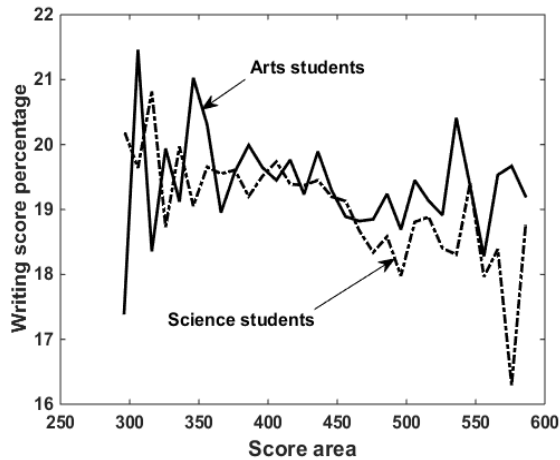


Figure 3-4
Distribution of Arts and Science Students' writing performance

Our interviews with some top Arts English learners indicate that Arts students prefer cognitive strategies such as dictionary use, note-taking, repetition, revision, etc while Science students prefer cognitive strategies such as word-formation, guessing, grouping, etc., such strategy preference differences can partly account for why Arts students do better in writing than Science students, Arts students prefer dictionary use, and tend to seek for accuracy in their language learning, therefore they are more concerned with accuracy of language use. Besides, they also tend to practice writing more both in writing assignment and note-taking, while Science students tend to be more concerned with fluency and meaning understanding. As Wen Qiufang (1995) comments good language learners attach much attention the improvement of their writing ability, they not only well finish the assignment, they may also keep on taking notes in English, writing diary in English. They take efforts to polish and improve their composition, once they finish the first draft, they tend to make repeated revision, they improve their writing by correcting mistakes with language form, mis-collocation of vocabulary, and the content of the composition as well.

Rubin (1975) made the similar findings with good learners, adding that in addition to focusing on communication, the good language learner is prepared to attend to form, good language learners often attend to the important formal features of the target language. As we know when marking writing test-papers in CET Band 4, teachers usually take into consideration of four aspects including language, content, relevance, and organization, by frequent practice of writing and by paying attention to language forms, Arts students are more likely to get high marks in writing part of CET Band 4. A piece of good writing requires not only topic-related content, clear and reasonable structure, but also accurate language forms,

grammatically correct syntax and semantically appropriate lexical collocation, the latter is the typical strength of Arts students.

4. CONCLUSIONS AND IMPLICATIONS

Through the careful examination of Arts and Science students' performance in listening, reading and writing in CET band, it has been revealed that the two groups of students do manifest differences. Generally speaking, Arts students' overall performance in the parts of listening, writing is better than that of Science students, meanwhile Science students manifest better reading performance than Arts students. Due to the differences in their expertise and specialized knowledge concerning majors, Science and Arts students manifest differences in background knowledge, thinking patterns and learning strategy preference, etc. which may lead to their differences in CET Band 4 scores. To sum up, Arts students do better in listening and writing, mainly for the reason that they have more free time to do extensive reading concerning western culture, history, politics, geography and society which help them to acquire rich background knowledge about western culture, which in turn improve their listening ability, since the listening material in CET is mostly related to that. At the same time, Arts students prefer dictionary use, repetition, association, memory, review and they pay more attention to both language meaning and language forms which help to improve their language accuracy in writing. Science students do better in reading mainly for the reasons that they prefer the learning strategies of contextualization, word formation, guessing, social/affective strategy, which helps them to do reading more quickly and efficiently than Arts students.

Considering the differences between Science and Arts students in their learning styles, thinking patterns and learning strategy preference, we propose some suggestions both for English language learners and teachers with the intention to improve English learners' comprehensive language ability.

For language teachers, they would bring benefits to students if they consider conduct learning strategy training to both Arts students and Science students, since our research indicates that Chinese English learners are not inclined to use metacognitive learning strategies and social/affective strategies, which hinders their learning process, therefore, students of both Arts and Science should be encouraged to make their learning plan, do regular review, actively engage in some group learning and cooperative learning. Qiu Shaoji (2009) remarks that teachers in their teaching process should consider the differences in learning styles between Arts and Science students, offer more opportunities of autonomous learning for Arts students who are found to prefer field independence learning, at the same time, encouraging

them to actively involve in classroom discussion, building up their interest in cooperative learning; for Science students who prefer field dependence learning, teachers should help them to develop their habit of independent thinking.

For the two groups of students, they can benefit from learning from each other, since each group has their own strengths and weaknesses in learning English. For Arts students, they can learn to use strategies of contextualization, word formation, guessing, etc to improve their reading efficiency and enlarge their vocabulary, and for Science students, they can learn to use repetition, association, dictionary use, etc to improve their language accuracy in writing; in addition, they can also try to find more free time to do extensive English reading to broaden their horizon, to learn more about English culture, society, history, etc., so that they can accumulate sufficient background knowledge about English-speaking countries.

Our present research is only focused on Arts and Science students' performance in CET Band 4 and the differences in the use of learning strategies, learning styles as the possible reasons. English learners' use of learning strategies is too broad a topic for discussion, future studies concerning the same topic can be done from other perspectives, for example, difference between top and low English language learners' learning strategies, between learners from different family background, ethnic background and educational background, etc. International joint research project can also be done concerning cross-national differences in the use of learning strategies and learning styles with the intention to help Chinese English learners to learn better.

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