Research and Ideas on the Development of Piano Sight-Reading Training Software Based on Lilypond Software and Python Language Application

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Abstract: Piano sight-reading training requires first to study the cognitive mental process of the brain; secondly, to reveal the current problems of many people with low piano sight-reading ability, especially the problems that do not require training from the cognitive mental process; third, the current pure The paper-based, solidified piano sight-reading training content is not suitable for solving this problem; fourth, from the wide application of computer technology in all walks of life, try to use Lilypond software and Python language application (hereinafter referred to as L·P). Change the purely paper-based, solidified training content, and stimulate and improve the psychological process of piano sight reading through the man-machine interface.

1. Introduction

At present, many piano learners are seriously lacking in sight reading ability. Take only the A-level piano test for middle school students' artistic expertise, which is led by the Education Department of XX Province, has long-term adherence and has a high degree of authority and gold content. Those who have obtained a certificate in this test can directly get extra points in the college entrance examination and high school entrance examination. Now it is also used as an indicator of the qualification to apply for the key high school art students.

Among them, two test contents including the main item and the sub-item are included. The main test content, in terms of degree, is at least the advanced stage level in the piano literature, which can be specifically seen from the table below.

From the analysis of this high school student's artistic specialty piano test, even if the sight-reading of works is so much lower than the main level of performance, if strict requirements are required, the pass rate will be far less than 30%. In fact, according to the author's actual experience, few students who participated in the test, even in the face of such a low-level work, can smoothly, completely and accurately sight-reading.

In many art college entrance examinations, according to the author's understanding, except for the piano-related exams set by the Shanghai Conservatory of Music, there is a “sight reading” test item, and other art college entrance examinations have no “sight reading” exam items and content.

As for amateur piano examinations in society, there will be no “sight-reading” examination items and content. Even the “Emperor Test” introduced in China in recent years, as well as the relatively strict piano test in China, have only added the “Basic Music Theory” and “Solfeggio” exam content, and it seems that the content of the sight-reading exam will never be set easily. . The reason for this is that if the content of the sight-reading exam is set, the difficulty will be greatly increased. This “increased difficulty” is not only reflected in the difficulty of sight reading itself, but also reflects that many piano learners do not have the ability to sight reading at all. In other words, because sight reading is generally not regarded as one of the contents of piano learning, it is avoided Related assessments and tests in this regard.

As we all know, the level of piano playing ability and level, the work sight-reading is an important measure and a touchstone. However, through the previous analysis, in the field of piano learning and teaching, it not only reflects the general lack of piano sight-reading ability, but also reflects the indifference to the cultivation of sight-reading ability.

To reflect on this kind of “indifference”, we have to trace the reasons for this kind of “indifference.”

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First, I think that the ability to play more works “sight reading” will naturally increase. It is undeniable that some people who have entered professional piano learning very early have a high level of sight-reading ability (in layman's terms, “strong hands-on ability in works”), but the phenomenon of weak sight-reading ability is not ruled out.

Second, most of the tests that need to reflect the ability and level of piano playing have no sight-reading content and links. This is like the “baton” of the college entrance examination, guiding piano learners and those engaged in piano teaching to not do sight reading ability learning, training and specialized teaching at all. As everyone knows, for “genius”, it does not need special learning and teaching to form corresponding ability. Unfortunately, geniuses are only a minority, and most people need special training to form and possess correspondingly better abilities. The same is true for piano sight reading ability. In the face of the current huge piano learning group, the negative effect guided by this “baton” has a great impact on the widespread lack of sight reading ability.

Third, there is a serious lack of sight-reading learning and teaching content, and lack of method and process requirements. For singing, sight singing and ear training have existed for a long time, and they are also commonly used as tests to measure a person's musical ability and level. However, the sight singing with monomelody sight singing as the main feature (even if it is a multi-voice sight singing is still a “single melody” for a single person), there is a huge difference compared with the piano texture sight singing. Even as the content of the original piano learning, it is very likely to be a single melody, but it also needs to be based on the “multi-voice” thinking for sight reading.

At present, it only focuses on the results, not on the knowledge learning and teaching phenomena of the process. The most prominent manifestation is in the field of piano learning. No matter how bad the performance is in the process of piano learning, or in the process of learning a certain piece of piano (the wrong reaction to the notation of the musical score), as long as the final result is good, it shows that the learning effect is good, and it has the corresponding Level. In other words, no matter how various and random mistakes occur in the learning and practice process, as long as there is no mistake in the final performance, it is considered that the corresponding piano learning goals and playing level have been reached. This obviously wrong learning method and process is widespread.

This is not only reflected in the lack of the connotation of piano playing ability, but also in the broader sense of learning through piano learning. For example, piano learning that does not pay attention to the learning methods and learning process will make it difficult to achieve goals such as brain cognitive ability training. In theory, the content of the learning ability test of other subjects and courses will never show the same content as usual learning and practice. However, the content of the piano playing ability test is a certain piece or a certain number that the player has played and practiced for a long time. First piano work. As a cognitive ability training, or a test to measure the level of cognitive ability, it must be judged by the new content and whether it responds accurately to the new content.

In this sense, the content of sight-reading learning and practice is indeed seriously lacking, because, firstly, many piano textbooks neither aim at sight-reading practice, nor do they consider themselves as sight-reading practice content; In piano textbooks for the purpose of sight-reading ability training, the systematic and gradual nature of sight-reading training is seriously lacking. Take the textbook “byer”, which is commonly used by beginners, from the very simple content at the beginning to the end of the book is already difficult. In each of the stages of difficulty, in the absence of sufficient content training and accumulation of sight reading ability, it has already crossed to the next higher difficulty level stage. Under the influence of other skill training, the procedural requirements of sight-reading training can not be achieved at all, nor can the goal of staged sight-reading ability be achieved. Third, even if the correct method is adopted and the procedural requirements are paid attention to, it is also due to some Once the content is solidified and reappears, the connotation training of sight reading is also missing. In other words, the content of the paper score is immutable. If a piano score is repeatedly practiced, it is easily affected by related memory and other factors, and it loses the meaning of the sight reading “new score”, and some even see it. After I played it again, I played it again immediately. Actually, the performance

of “retro score” has already appeared, so the cognitive process of “sight reading” is not reflected. It is also because of “you can do it again”, I think it doesn't matter if you make a mistake, there is a second and third chance, which makes the learner slack in all aspects and makes the performance in the “process” extremely bad. And so on, are not conducive to the formation of sight-reading ability.

First, in the “storage” of the relevant software on the computer, all piano works and music score documents can be accommodated. At the same time, through careful setting and sorting, many levels are divided (if necessary, dozens, dozens, hundreds, and thousands of levels can be divided), so as to obtain a good process of step-by-step sight reading learning. Of course, it is not that everyone has to complete the learning process of so many levels, but it can provide the content and path for the training from scratch.

Second, through the development of corresponding computer software, the emergence of “new music scores” that are not dictated by human will can be realized, thereby forcing sight-reading trainers to fully mobilize the enthusiasm, initiative, concentration and distribution of their brains as much as possible. , And the pursuit of correct rate, because there is no chance and dependence on the second “recurring”.

This new music score is programmed and programmed to obtain the “unexpected” score and the arrangement of the rhythm and pitch of the spectator, just like the “poker” game in computer games, each time it is opened, it will be “random”. novel”.

Third, it is possible to arrange multiple layouts of the sheet music, so that the spectator can adapt to the different visual experience of the same sheet of music or different sheet of music. Visually large notes and large intervals between notes (or vice versa) will affect the sight-reading effect. Visually large notes and sheet music with large intervals between the notes are also less difficult to visualize, on the contrary, the difficulty will be greater. Using different layouts, it is also possible to make the scores of the same difficulty become relatively easy, so as to realize that the work of the same difficulty can be faced step by step, from easy to difficult, which is common in cognitive training.

2. The Basic Principles of Cognitive Psychology of Piano Sight-Reading

The research object of cognitive psychology is human cognition, including the whole process from sensory input to conversion, reduction, processing, storage, extraction and use. It also includes the research of pattern recognition, attention, memory, visual representation, speech, problem solving, decision-making, etc. in mental skills. Cognitive psychology always compares people with computers, and has the ability to accept input information, process and store it, and then produce a planned output, according to the input, conversion, storage, and extraction of information.

In the field of education, not only use the principles and results of cognitive psychology to study the development problems of different disciplines, but also refine them into various disciplines in order to conform to the cognitive laws studied by cognitive psychology, so as to carry out corresponding curriculum preparation , Choose the corresponding education and teaching mode, and more detailed to the research and application of the teaching method of each course within the subject. Cognitive psychology is particularly popular and effective in language teaching research. At the same time, non-linguistic teaching is also adopting the principles and results of cognitive psychology, including science courses, and even extended to a wider range of fields, such as management, sociology and other fields. The medical field has more use of cognitive psychology. early.

In music research, there are many studies that are combined with psychology, such as “Music Psychology Handbook”, “Music Learning and Teaching Mind”, “Philosophy of Music Education” (“Music and Creative Thinking”, etc., as well as some “Music Psychology”). However, none of the researches in the field of “treatment” has gone deep into the field of cognitive psychology, and has nothing to do with piano teaching.

The “cognitive” attribute of the technical content in music will never change. At the same time, music as a sound “text record” has the same attributes as other languages. The reading and creation of “language” has become an important connotation of language disciplines. Even motor skills, in

other disciplines, such as sports, its training thinking and cognitive methods, also determine the quality of sports. Unfortunately, the cognitive and behavioral nature of piano sight reading has been generally ignored. Even if there are some theoretical explanations, there are almost no practical research content and results for the highly operational piano teaching.

3. L.P Technology and Piano Sight-Reading Learning Content and Software Development Ideas

(1) Pay attention to the training of concentration, transfer and distribution of attention. The musical notation (position between the lines, the symbol of the duration) in the sight-reading is simple. Using the advantages of L.P to enhance the sense of “flowing” of notes in time sequence, so that the player can accurately obtain them in order and implement them in the corresponding operation of the keyboard. It can also play a decisive role in the concentration, transfer and distribution of attention. A large number of teaching practices have proved that there are rigidities in the attention distribution behavior that cannot be “distributed”, or that the “distribution” does not conform to the “musical score logic” phenomenon. Using LP technology and software can do special processing of score symbols to correspond to Means, use the correct logical sequence to “attract” the learner's attention distribution, and at the same time stabilize the original attention.

(2) Concentration aroused. In the corresponding software, the corresponding sight-reading content set is only presented once, and the flexible layout adjustment is used to make it produce the psychological basis of “achievable”, and the “attention” that is confidently supported is strengthened, thereby stimulating the concentration of attention. ability. Of course, there can also be a special “re-reading once” sight-reading content and corresponding options.

(3) The specific content and design ideas of the software. Use the color of the music notation to flash, change in size, and intersperse with directional arrows, time movement and time band line of the beat speed to form a significant “bait attraction”, and provide feedback and prompts through the “MIDI” interface. It can also adapt to the initial abilities of learners of various levels through flexible and uniform adjustments in the response time in the rhythm of the beat, and flexible changes in the size of the chart layout. You can also randomly perform variations, pitch shifts, and range conversions on the already sighted scores to enrich the sight-reading content. Of course, it is also necessary to equip with recordings played by high-level players, so that the sight-readers can give musical guidance.

In order to form “correct awareness” in sight reading, a large number of simple “piano textures” that can ensure correct sight reading will be formed in the primary stage, including simple rhythmic “one-handed sight reading” and extremely simple “two-handed sight reading” and many more.

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