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THE EFFECTS OF INSTRUCTIONAL MEDIA ON GROUP PIANO STUDENT PERFORMANCE AND ATTITUDE

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This study investigated the effects of instructional media on group piano student performances and attitudes when used in student practice. Sixteen participants divided into four treatment groups practiced individually three times during a two-week period for each of four modules comprised of keyboard theory exercises and repertory pieces. The effects of using a MIDI sequenced recording, video, multimedia computer program, and no media were assessed with the following dependent variables: note accuracy, rhythm accuracy, and musicianship for two repertory pieces; and correct chords, rhythm, and voice leading for two keyboard theory exercises. An additional aspect of this study investigated the possible effects of instructional media on student piano performance when used for in-class presentation of keyboard skills. Three intact group piano classes ($N = 29$) were instructed in one of three conditions: use of MIDI sequenced recording, videotape, and multimedia computer presentations. The comparison of different media used in classroom presentation showed no significant differences between treatment groups. Results of the study, however, indicated that piano practice was effective for improvement of performance accuracy in keyboard theory exercises and repertory pieces. This was true regardless of the presence or absence of media. Although significant differences were not found among the groups in performance accuracy, student attitudes toward the practice sessions and performance material were influenced by use of media in practice.

The relationship between music and technology is not new; they have been inextricably intertwined since their inception. Some have argued that one of mankind's first uses of tools was to create sound, and as tool making progressed, so has music making (Gottschalk, 1994). Technology has become a vital part of education, perhaps because it increases our ability to communicate with the learner and thus our effectiveness as teachers. Although research in the use of technology in music instruction has been limited, development of technologies to adapt them to music instruction has been extensive, both in the academic community and in the music industry (Higgins, 1992). Educational media such as programmed instruction, audio recordings, visually based media (slides, filmstrips and motion pictures), television, video recordings, computer-assisted instruction, and interactive multimedia all have been utilized in music teaching and learning.

Audio and audiovisual media used to demonstrate audio and video models have been examined as an addition to, and in lieu of traditional instruction, and have been compared to each other. Audio and video instructional media have been used to model correct performance. Studies investigating the use of audio modeling found this medium to be effective (Dickey, 1991; Folts,

1973; Fortney, 1992; Peightel, 1971; Puopolo, 1970; Rosenthal, 1984; Rosenthal, Wilson, Evans, & Greenwalt, 1988; Sperti, 1970/1971; Wiehe, 1971/1972; Zurcher, 1972) more often than not (Anderson, 1981; Arant, 1970/1971; Biggs, 1960/1962; Hodges, 1974/1975). Of the nine studies that found significant differences, all but one study had used audio modeling either for practice or as supplementary activity to instruction rather than in place of instruction.

Few studies have found video to be an effective medium for modeling (Fleming, 1977; Jordan, 1980; Michelson, 1984), and others have not found significant differences (Burgess, 1974/1975; Leppla, 1989/1990; Rees, 1976/1977; Rothlisberger, 1992/1993). When comparing audio versus video modeling, Teter (1995) found significant differences in favor of video modeling, whereas Quindag (1992) and Linklater (1994/1995) found no significant differences between the two media.

Investigations in music instruction have examined the effects of multimedia on listening (Fortney, 1995; Goodson, 1992/1993; Hughes, 1991; Lin, 1994/1995; Sigurjonsson, 1991), interpretation (Adams, 1989/1990), and saxophone pedagogy (Orman, 1995/1996). Multimedia instruction was found effective by Hughes (1991), Adams (1989/1990), Goodson (1993), and Orman (1995/1996). Only one study was found that used an interactive multimedia computer program to model correct performance (Adams, 1989/1990).

Electronic technology has made new tools available to the keyboard teacher that have become smaller, more portable, more versatile, and less expensive (Lymenstull, 1991). Before the impact of the digital piano laboratory, instructional media included tape recordings, videotapes, television, slides, filmstrips, programmed units, and computer-assisted instruction (Lancaster, 1977). Digital piano labs with high quality teacher control centers, keyboards with sampled sounds, sequencers, and computers interfaced with student pianos now have replaced the electronic labs (Lyke, 1996). Group piano classes that develop functional piano skills have become firmly established in the curricula of American colleges and universities. The growth of group piano instruction corresponds to the advances in technology. Using instructional media allows a broad range of experiences while bringing interest and variety to instruction. Piano classes may be transformed through the use of instructional media; yet there is a need to explore the incorporation of this technology into the piano classroom and its effects on class piano teaching (Skroch, 1991/1992).

The purpose of the present study was to examine possible effects of instructional media capable of providing audio and video models on student piano learning. Effects of audio and video models on piano practice and performance of group piano students were investigated. The uses of (a) a MIDI-sequenced recording (aural model), (b) a video recording (aural-visual model), (c) an interactive multimedia computer program (multimedia), and (d) no media (no model) on individual student piano practice and performance were compared. A secondary aspect of this study compared the

effects of classroom use of (a) a prerecorded MIDI-sequenced recording (aural model), (b) a video recording (aural-visual model), and (c) an interactive multimedia computer program (aural-visual model) on student piano performance.

Method

Practice Procedure

The 16 participants were music majors enrolled in a group piano course. None of the participants were piano majors, and all previously had passed the first three levels of group piano. Each participant practiced the performance material with either a MIDI-sequenced recording, a videotape, an interactive multimedia program, or no media. Participants remained in the same practice condition for each of the four practice modules.

The performance material was practiced by each participant in one of four conditions for each of four practice modules: (a) traditional practice with no media (Traditional Group), (b) practice with a MIDI sequenced recording (Sequencer Group), (c) practice with a videotape (Video Group), and (d) practice with an interactive multimedia computer program (Computer Group). There were four students in each group.

Performance material in the four practice modules included two keyboard theory exercises and two repertory pieces. Each participant scheduled three practice sessions for each module over a two-week period and was instructed not to practice the material included in the module outside of the practice sessions. The performance material in each module was introduced in piano class before the practice sessions were scheduled.

Before each practice session, participants were recorded playing the performance material that was to be practiced on a sequencer and digital keyboard, and then were instructed to go through all practice steps. No limit was set on the amount of practice time for each practice session, but subjects were instructed to complete each practice step. After each practice session, participants were recorded again playing the performance material. Participants were allowed to choose their own recording tempo. Questions pertaining only to the equipment or practice instructions were allowed in the practice sessions.

Following the last practice session of each module, participants completed a questionnaire specific to the group in which they were placed (see the Appendix). Participants in each group were asked if their performances improved with the practice sessions, and if yes, what aspects improved. Students rated the media used, the practice sessions, and the difficulty of the piece or exercise. Open ended questions concerning what helped the most and what would have helped in using the media or in the practice session also were included. The questions remained the same on each of these surveys, with the exception of the questionnaire given to the Traditional Group (no media). Question 7 on the survey asked participants if they would practice with the media they were using. Since this group was not practicing with media, the question asked if they would practice with par-

ticular media. The media listed in the question changed with each module so that students in the Traditional Group could answer whether they would practice with a MIDI sequenced recording, videotape, or multimedia computer program if available.

Practice Conditions

The participants practicing with no media (Traditional Group) were given written instructions that reviewed what was discussed in class about the repertory piece or keyboard theory exercise and the practice steps to be taken by the participant.

Those practicing with the MIDI sequenced recording (Sequencer Group) were given the same written instructions with the addition of the sequencer measure marker numbers that indicated the location of the section to be practiced of each piece or exercise on the disk. In the first and third practice modules, the recording on the MIDI sequenced disk included all of the keyboard theory exercises that the participants could listen and/or play along with during practice. Participants also had the choice of hearing only one hand at a time and moving forward and backward—as well as stopping at any point in the chord progression. In the fourth practice module, participants also were allowed to slow down the tempo of the repertory piece, listen to only one hand at a time, and listen to, or play along with the disk as many times as needed.

The Video Group participants received the same written instructions, with the addition of excerpt numbers that indicated the section of each piece or exercise on the videotape. Those individuals using the videotape were allowed to rewind and fast forward as needed and watch or play along with the videotape as many times as needed. The picture on the videotape in each module was an "over-the-shoulder" shot of a pianist's hands playing the excerpts in each module. The participant could view the hand position, fingering, and arm movement of the pianist. A count-off and metronome sounded by the sequencer and digital piano used in the videotaping was recorded to allow the participant to start with and play along with the videotape.

The Computer Group participants (interactive multimedia computer program) did not receive the same written instructions as the other groups. Instructions were included in the multimedia presentation itself. The instructions informed participants that the computer program would review what was discussed in class and work through each section of the repertory piece or keyboard theory exercise. Each section of the main menu in each multimedia program led the participants through the same practice steps that were given to the other three groups on their instruction sheets.

In each practice module, the multimedia program included a series of questions with feedback for correct and incorrect answers. If a question was answered incorrectly, information on a subsequent screen stated why the answer was wrong and instructed the participant to try again. Correct answers took the participants to a screen that included positive feedback and the next practice step. Graphics, sound, animation, and movie files were

also used in each module. The graphics were of a keyboard with the keys to be played highlighted with various colors. The animation in each module included these same pictures along with movies files captured from the video recording used in the videotape condition. Participants viewed a model of the performance with the movie files that were synchronized with an animation of the highlighted correct keys being played.

Presentation Procedure

For the secondary aspect of this study, effects of different media on classroom learning were investigated with three intact fourth semester piano classes ($N = 29$). They were instructed in one of three conditions: (a) use of MIDI sequenced recording (Sequencer Class), (b) videotape (Video Class), and (c) multimedia computer (Computer Class).

Participants in each of the three groups were presented performance material during the regular piano class in one of three conditions: (a) instruction with MIDI sequenced recording (Sequencer Group, $n = 10$), (b) instruction with videotape (Video Group, $n = 10$), (c) instruction with multimedia computer presentation (Computer Group, $n = 9$). The keyboard theory exercise (Presentation 1) and repertory piece (Presentation 2) were presented on different class days for a total of two presentations for each of the three classes. After instruction and without additional practice, each participant was recorded playing the performance material on a digital sequencer and keyboard.

A MIDI sequenced recording was used to model a correct performance during the presentations for the Sequencer Class. The instructor controlled the tempo and length of each section to be played during the presentation. The MIDI sequenced recording also could be started and stopped at any point in the progression and moved forward or backward.

The instruction for Video Class included a videotape model of correct performance. The picture on the videotape in each module was an "over-the-shoulder" shot of a pianist's hands playing the section, in which the participants could view the hand position, fingering, and arm movement of the pianist. A count-off and metronome sounded by the sequencer and digital piano was recorded to allow the class to start with and play along with the videotape.

The Computer Class instruction included a multimedia presentation utilizing graphics, sound, animation, and movie files. The movie files were captured from the video recording used in the presentation for the Video Class. Participants also saw a model of the performance with the movie file that was synchronized with an animation of the correct keys highlighted on a keyboard. Presentation of the repertory piece included notes on a music score highlighted and synchronized with the correct keys highlighted on a keyboard and presented with sound.

Rooms and Equipment

All practice sessions, presentations, and recordings were performed on digital keyboards (Roland KR 4700 and HP 1000S). For the group utilizing the MIDI sequenced recording, a Roland MT 120 sequencer and the internal sequencer of the Roland KR 4700 were used. The videotape group viewed the tapes on a Panasonic VCR and NEC television. The participants who practiced with the interactive multimedia computer program used a Macintosh 7100/66 (Practice Module 1) and an Apple Performa 6214 (Practice Modules 2-4). A Macintosh 7500 and LCD projector were used to display the multimedia for the class presentations in the secondary aspect of the study. Zenith and Hitachi VHS video cameras were used to record the performance material seen and heard by the Video and Computer Groups.

All performances were recorded on a digital sequencer (Roland KR4700 or MT120) for analysis. Performances recorded on the Roland KR4700 were saved as standard MIDI files, downloaded into the Finale 3.7 notation software, and then transcribed for scoring note and rhythm accuracy. Performances recorded on the Roland MT120 were converted to MIDI files through the Roland ISM Converter and finally transcribed through Finale for scoring. Key signature, time signature, and level of quantization were chosen as the notation software read all notes and rhythms from the MIDI file.

Production of Multimedia Projects

The multimedia computer programs were created with the authoring software, Digital Chisel HTML (version 2.1.3). This authoring program included templates for questions in different formats: multiple choice, true/false, matching, essay, picture pick, and typed responses. The hypertext and hyperlinking feature of Digital Chisel HTML allowed screens created in the project to be linked nonsequentially. The nonlinear organization of the program allowed users to freely navigate through the project and interact with the program.

Graphics, sound, movies, and animation could be imported into the program. The software program FusionRecorder (version 1.1) was used to capture the video excerpts, digitize the sound and picture, and convert to QuickTime movies. The graphics used in the computer program were downloaded from the *Piano Parlor* page on the World Wide Web (the page no longer is available on the Web) and the animations were produced with Digital Chisel HTML (version 2.1.3) and Macromedia Director Version 4 (for all except Modules 1 and 2). Animations for Modules 1 and 2 were produced using the animation feature in Digital Chisel HTML. The music score used for class presentation was transcribed in, and imported from Finale (v. 3.7) into ClarisWorks (v. 2.1), saved as a Macintosh PICT file, and then imported into Director.

Results

Since the level of data was ordinal and sample sizes were small, the Kruskal-Wallis Analysis of Variance by Ranks was chosen for the analyses. There was also a wide range of scores within the groups on some measures,

particularly for incorrect notes and rhythm. Reliability was calculated for both notated and expressive aspects of performances. An independent observer scored 20% (randomly selected) of the pretest and posttest performances, and compared the notated performances with printed scores of the performance material. Results of the Spearman Rank Correlation Coefficient of the experimenter and observer scores indicated values of $r = .93$ for correct chords, $r = .96$ for correct voice leading, and $r = .78$ for correct rhythm.

For the repertory pieces, notated variables included note and rhythm accuracy. An independent observer scored 20% (randomly selected) of the pretest and posttest performances, and compared the notated performances with printed scores of the performance material. Results of the Spearman Rank Correlation Coefficient of the experimenter and observer scores indicated values of $r = .92$ for note accuracy and $r = .91$ for rhythm accuracy. Musicianship also was rated using a 5-point scale (5 being best) on each of the repertory pieces. The criteria for musicianship included correct performance of dynamics, expressive markings, pedaling, and phrasing. Reliability also was calculated for the musicianship ratings by dividing the number of agreements (ratings within one point) by the total number of performances evaluated. An independent observer listened to 20% (selected randomly) of the pretest and posttest performances, and rated the appropriate musicianship categories using the 5-point Likert-type scale. Reliability for musicianship ratings was .82 between the experimenter and the reliability observer.

Significant differences in note accuracy were not found between treatment groups, nor did any group consistently receive higher means than the other groups. Rhythm accuracy scores were similar to the note accuracy scores in that significant differences between the groups were not found and no one group scored consistently higher than the other groups. Significant differences were not found among the groups in voice leading in the keyboard theory exercises nor among musicianship in the repertory pieces.

Results indicated no significant differences in final performance tempos chosen by the participants in each group. The faster tempos were chosen by the Traditional Group in three out of the four modules, whereas the Computer and Sequencer group chose slower tempos for final performance. Significant differences in the amount of total practice time were not found between the treatment groups. The Computer Group had the highest number of minutes of total practice time (322.5 min) while the Traditional Group practiced the least number of minutes (195).

On all surveys, participants responded that their performances improved with the practice sessions and that their practice was efficient and helpful. In identifying what aspects of the participant's playing improved, the Traditional Group commented mostly about tempo and accuracy, and the Sequencer Group commented more about tempo and knowledge of the material. The Video Group responded that their knowledge and tempo improved,

and the Computer Group commented mostly about the improvement of their technique, tempo, knowledge, and expression.

As to what was most useful when using the media, the Sequencer Group commented mostly about hearing a model of the performance and playing along with the sequencer. The Video Group responded that playing along with the video and seeing different aspects of the performance model were the most helpful. The Computer Group found that seeing the performance model and specific features of the computer program were most helpful. The Traditional Group commented on the usefulness of small section practice. In response to use of the media after each module, not all participants of each group responded that they would use the media to practice. Three out of the four participants in the Traditional Group indicated that they would prefer to practice with a sequencer, and one chose video.

Participants rated the difficulty of the practice session (Traditional Group) or use of the media (other three groups) on a 6-point scale with 1 indicating "very difficult" and 6 indicating "very easy." In Module 1, all groups seemed to view using the media or the practice session itself as "somewhat easy" or "easy." In Modules 2 and 3, the Traditional Group viewed their practice sessions as "somewhat difficult" (M = 3.0). A significant difference was found in Module 2 ($p < .01$) and Module 3 ($p < .02$) between the groups with the Computer Group rating the use of the computer as "very easy" ($M = 5.25$ and M = 6.0, respectively) compared to the Traditional Group ratings of practice as "somewhat difficult" (see Table 1). All three groups that used instructional media rated their practice with the media as easier than the Traditional Group.

Table 1

Mean Ratings for Judged Difficulty of the Practice Sessions for Each Module

		Group			
Module	Kruskal-Wallis (H) $df = 3$	Traditional	Sequencer	Video	Computer
1	5.93	4.00	4.75	5.00	5.75
2	*10.18	3.00	5.00	5.00	5.25
3	*9.36	3.00	5.00	5.25	6.00
4	3.48	4.00	5.00	5.25	5.50

Note. 6-point Likert scale, 1 = very difficult to 6 = very easy.
*Significant difference ($p < .05$).

Responses from the Traditional Group about which aspects of the practice helped the most included slow-to-fast practice and small section practice. Most of the comments from the Sequencer Group concerned hearing the model and small section practice. Frequent comments by the Video Group included seeing the performance model and repetition while the responses by the Computer Group concerned seeing the performance model and small section practice.

Classroom Presentation

After the classroom keyboard theory presentation, participants performed the same chord progression twice. The first performance began with the right hand in root position of the first chord, and the second playing began with the right hand in first inversion of the first chord. The total number of correct chords, rhythms, and voice leading possible was 10.

The Video Group performed with a slightly higher score on the correct chords of the inverted progression than the other two groups. Differences in scores of groups were not significant. Differences in voice leading among groups were not significant in the first performance (root position), or in the second performance (inversion). The Computer Group scored the highest means for correct rhythm for both performances of the keyboard theory exercise. However, differences among groups were not significant.

For the repertory piece, the Computer Class received lower mean scores of incorrect notes and incorrect rhythm on the repertory piece. No significant differences were found among the groups.

Discussion

Results indicated no significant differences among treatment groups in student performance. All students appeared to learn regardless of treatment. Each participant improved with the practice sessions and all participants responded in each survey that their performance had improved with the practice sessions for each module. One factor contributing to the lack of significant differences was the small sample sizes of the groups. The sample size used in this study may be too small for conclusive results.

It is possible that the capabilities of the computer program in presenting the information—in addition to providing performance models—may have been helpful to students in ways not measured in the present study. Although differences were not significant, the Computer Group scored slightly higher means on both the keyboard theory exercises and the repertory pieces, and students in this group had the highest gain scores in 60% of the total note and rhythm accuracy scores. Previous studies have found multimedia to have a significant effect when compared to traditional instruction (Adams 1989/1990; Goodson, 1992/1993; Hughes, 1991; Orman, 1995/1996); however, studies that compared multimedia to other instructional media in music instruction were not found. In the present study, the use of multimedia instruction that presented information in different media, such as sound, animation, and graphics, was compared to the use of a sequencer or video tape

and showed that the multimedia program was no more effective than the other two media. Kozma (1991) stated that capabilities of a particular medium, in conjunction with methods that take advantage of these capabilities, "interact with and influence the ways learners represent and process information and may result in more or different learning when one medium is compared to another for certain learners and tasks. The instructional method used in this study may have not taken advantage of the full capabilities of the each of the media used.

These results imply that the use of a performance model did not affect student performance accuracy significantly. Previous research found the use of audio modeling to be effective. Compared to no modeling in student practice in this study, the use of a MIDI recording did not seem to affect student practice on the keyboard theory exercises or repertory pieces. Comments made by the sequencer group concerning what would have been more useful in using the disk were mostly regarding the need to hear the voicing and arpeggiations of the chords. This may have been why the participants in the sequencer group did not score as high on the keyboard theory exercises as they did on the repertory pieces. Although the effects of audio modeling compared to no modeling were not significant, the sequencer group identified the performance model as the aspect of the practice that helped most.

Previous studies that have compared audio versus video modeling have found significant differences in favor of video modeling (Teter, 1992) and no significant differences between the two media (Quindag, 1992; Linklater, 1994). In comparing aural and visual modeling in the present study, video modeling (video and computer groups) was not superior to audio modeling (sequencer group) for the keyboard theory exercises or the repertory pieces. Although video modeling was not found to be significantly different than audio modeling, the video and computer groups identified viewing the performance model as the aspect of the practice that helped most.

All groups that used instructional media in the practice sessions used more total practice time than the traditional group. The computer group had the most total practice minutes over the four modules, followed by the video group. More practice time did not affect performance, but it is interesting to note that the computer group gave the highest ratings on the ease of using the media compared to the other two media groups for all four modules with significant differences (compared to the Traditional Group) found for Module 2 and Module 3. The use of the media in practice may have taken more time considering that these groups listened to the performance model (which the traditional group did not have to take time to do in following the practice steps). Using media in the practice sessions may have maintained students' interest and motivation longer than those in the traditional group.

Slightly faster final tempos from Posttest 3 were chosen by the traditional group, except in Module 3. The video group consistently chose the second fastest final tempos in each module, and the computer group usually chose the slowest tempos for the final posttest. Hearing the performance model at slower and faster tempos may have affected tempo choices, as

most of the faster tempos were chosen by the Traditional Group. The Sequencer Group had the ability to hear the model at many different tempos, but the video and Computer Group only heard a set number of tempos; however, this did not seem to affect tempos chosen for the final performance.

Of the groups that used media, the Computer Group and Video Group indicated that they would practice with media more often than the Sequencer Group. However, three out of the four participants from the Traditional Group selected the sequencer as a preferred tool for practice. Since the Traditional Group did not practice with any of the media, they may have chosen the sequencer because it is regularly used for classroom instruction. Most of the participants who used the computer and video to practice indicated that they would choose the computer or video to practice. Attitudes of the participants toward using instructional media during practice seem to be affected by experience with the media.

The performance material from Module 2 was rated as more difficult than the other three modules by all four groups. However, only the Traditional Group rated the Module 2 practice sessions as significantly more difficult than the other three groups. The Traditional Group rated Module 3 practice sessions as significantly more difficult and the keyboard theory exercise as more difficult than did the other three groups. In Module 3, the Traditional Group also practiced more minutes and chose slower final tempos than the other three groups. Although participants in the Traditional Group received some of the highest means for this module, their attitudes toward the performance material and the difficulty of the practice sessions was not reflected in their ability to perform the exercise. As found in previous research, perhaps the use of media in student piano practice positively affected the attitudes of students toward the performance material and practice.

Regarding the secondary aspect of this study, significant differences were not found among the groups for the keyboard theory exercise or repertory piece, and none of the groups consistently scored higher means. Perhaps if the participants had been allowed to practice after instruction, differential effects may have been demonstrated. Video and computer media were used only once for each classroom presentation, which may not have been enough time to demonstrate effects. Although the MIDI sequencer was a regular part of group piano class instruction, it did not significantly affect student performance after instruction. Scores of the Sequencer Class in the inversion performance of the keyboard theory exercise were not as low as the scores of the other groups in correct chords and voice leading. The inversion performance of the exercise was to determine how well the students could successfully apply the rules of voice leading and play correct chords and rhythm without further practice. The scores of the Sequencer Class may have been affected by previous experience with classroom instruction that incorporated the MIDI sequencer.

Although the results indicated no significant differences between the groups who used media or no media, they do imply considerations for music educators incorporating technology into the classroom or student practice. Student attitude towards media and preferences for particular media should be regarded. Results of the present study prompts further investigation into ways in which media affects student attitude towards the learning material and practice, as well as how to effectively demonstrate correct performance models through instructional media. Further research should continue to explore the use of media in piano practice and classroom teaching methods as well as instruction used in conjunction with instructional media. Since the use of technology has become a vital part of education, the effectiveness of media in music instruction and practice should continue to be questioned and explored.

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Appendix: Student questionnaire given to each of the four groups following the last practice session of each module

TRADITIONAL GROUP

1. Did your performance improve with these practice sessions?

Yes_____ No_____

2a. If yes, what aspects of your playing improved? 2b. If no, why didn't your performance improve?

_____
_____
_____

3. What aspect of the practice did you think helped the most?_____
_____
_____

Circle a rating below:

4. Your practice was:

1	2	3	4	5	6
extremely efficient	very efficient	efficient	somewhat efficient	inefficient	took way too much time

5. The practice sessions were:

1	2	3	4	5	6
very difficult	difficult	somewhat difficult	somewhat easy	easy	very easy

6. The practicing was:

1	2	3	4	5	6
not helpful at all	slightly helpful	somewhat helpful	helpful	very helpful	extremely helpful

7. If a *sequenced disk had been available, would you have used it to practice?

Yes_____ No_____

8. What do you think helped the most during the practice sessions?_____
_____
_____

9. What would have made the practice sessions more useful?_____
_____
_____

10. Rate the difficulty of this exercise:

1	2	3	4	5	6
easy					difficult

*For Module 1 only

SEQUENCER GROUP

1. Did your performance improve with these practice sessions?

Yes_____ No_____

2a. If yes, what aspects of your playing improved?_____

_____

2b. If no, why didn't your performance improve?_____

_____

3. What aspect of the practice did you think helped the most?_____

_____

_____

Circle a rating below:

4. Your practice was:

1	2	3	4	5	6
extremely efficient	very efficient	efficient	somewhat efficient	inefficient	took way too much time

5. Using the sequenced disk was:

1	2	3	4	5	6
very difficult	difficult	somewhat difficult	somewhat easy	easy	very easy

6. Using the sequenced disk was:

1	2	3	4	5	6
not helpful at all	slightly helpful	somewhat helpful	helpful	very helpful	extremely helpful

7. If the sequenced disk were always available, would you use it to practice?

Yes_____ No_____

8. What do you think helped the most when using the sequenced disk? _____

_____

_____

9. What would have made using a sequenced disk more useful?_____

_____

_____

10. Rate the difficulty of this exercise:

1	2	3	4	5	6
easy					difficult

VIDEO GROUP

1. Did your performance improve with these practice sessions?

Yes_____ No_____

2a. If yes, what aspects of your playing improved?_____

_____

_____

2b. If no, why didn't your performance improve?_____

_____

_____

3. What aspect of the practice did you think helped the most?_____

_____

_____

Circle a rating below:

4. Your practice was:

1	2	3	4	5	6
extremely efficient	very efficient	efficient	somewhat efficient	inefficient	took way too much time

5. Using the video tape was:

1	2	3	4	5	6
very difficult	difficult	somewhat difficult	somewhat easy	easy	very easy

6. Using the videotape was:

1	2	3	4	5	6
not helpful at all	slightly helpful	somewhat helpful	helpful	very helpful	extremely helpful

7. If a video tape were always available, would you use it to practice?

Yes_____ No_____

8. What do you think helped the most when using the video tape? _____

_____

_____

9. What would have made using the videotape more useful?_____

_____

_____

10. Rate the difficulty of this exercise:

1	2	3	4	5	6
easy					difficult

COMPUTER GROUP

1. Did your performance improve with these practice sessions?

Yes_____ No_____

2a. If yes, what aspects of your playing improved?_____

_____

_____

2b. If no, why didn't your performance improve?_____

_____

_____

3. What aspect of the practice did you think helped the most?_____

_____

_____

Circle a rating below:

4. Your practice was:

1	2	3	4	5	6
extremely efficient	very efficient	efficient	somewhat efficient	inefficient	took way too much time

5. Using the computer program was:

1	2	3	4	5	6
very difficult	difficult	somewhat difficult	somewhat easy	easy	very easy

6. Using the computer program was:

1	2	3	4	5	6
not helpful at all	slightly helpful	somewhat helpful	helpful	very helpful	extremely helpful

7. If a computer program were always available, would you use it to practice?

Yes_____ No_____

8. What do you think helped the most when using the computer program? _____

_____

_____

9. What would have made using the computer program more useful?_____

_____

_____

10. Rate the difficulty of this exercise:

1	2	3	4	5	6
easy					difficult