

The Effect of Two Learning Conditions on a Dancer's Technical Accuracy and Confidence in a Simulated Performance Setting

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Abstract

In dance classes, mirrors are used to help students see if they are using proper alignment and technique. Mirrors are used in the classroom, but are not used in performances. Performances usually take place on a stage, with stage lighting. The purpose of this study is to see if there is a notable impact on the technical accuracy and confidence of the dancer when learning dance with the mirror versus learning dance without the mirror. For this study, participants learned ballet sequences with and without the mirror, and executed the sequences in a simulated performance setting. A faculty panel assessed the performance of the dancers using a survey. Following their performance, the dancers evaluated themselves using an initial survey, generally rating their performance in each testing condition (with the mirror, and without the mirror). After completing both testing conditions, participants filled out a final survey rating their performance in both rounds, and comparing the two. This study adds to the research being done in the dance science community. It aims to assess whether the mirror plays a significant role in aiding or hindering the dancer's accuracy and confidence in a performance setting. Results showed that the mirror has both benefits and disadvantages when learning movement to be executed in a performance setting. Participants indicated similar advantages and disadvantages, but varied in their conclusion on whether learning with the mirror was more beneficial than without the mirror. This lead me to conclude that the use of the mirror is individualized, and the effects will vary from person to person.

Introduction

Mirrors have been used to aid in teaching dance for years. Recently, there have been

debates on whether learning with the mirror or without the mirror is more beneficial for assisting a dancer with technical growth. Shantel Ehrenberg conducted a study in which she taught several classes with and without the mirrors, and then interviewed participants on their experience. She found that kinesthetically, dancers feel better when learning without the mirror. However, many of her participants indicated that the mirror can be a useful tool, and one commented that the mirror was merely a large part of the dance culture (Ehrenberg, 2010). Some studies have indicated that the mirror is an important tool for motor learning. Dearborn and Ross found that college dancers who had learned movement with the mirror had better retention, after a two-week span, than college dancers who had learned the movement without the mirror. Similarly, functions of the nervous system suggest that "imitation is important in human development for learning motor skills" (Farthing, et al. 2013). The mirror neuron system (MNS) allows for sensory neurons and visual properties to aid in motor learning. Learning with a mirror can limit the complexities of movement imitation and "activates neural pathways that enhance cross-education" (Farthing et al. 2013). This means that learning with a mirror could assist a dancer with motor learning on both sides of the body, rather than just the side they are practicing the movement on. There have been few studies done on this subject matter, however, there are findings that suggest the mirror can be both beneficial and hindering. Ballet teacher, Gretchen Ward Warren, says that she believes limiting the amount of use of mirrors in the beginning level classes assists the students in learning the motor functions. She says this can help beginners feel the movement in their body, and commit it to muscle memory (Dearborn and Ross, 2006). Many of the studies done on this subject matter

have been conducted in a classroom setting. The classroom is an important place to learn movement and to advance technically, however, pre-professional and professional dancers train to enhance their performance later down the road. The performance setting is much different than the classroom setting; there are added environmental factors, such as stage light, which can affect the dancers balance and proprioception. This study aimed to look at the mirror from a different perspective: performance. Does learning with or without the mirror affect a dancer's performance when you add stage light?

Methods

For this study, five participants enrolled in the University of Wyoming's advanced ballet class for the Spring 2017 semester volunteered. Before participating, the project investigator provided all participants with a consent form describing what they would be asked to do, and indicating they had not suffered an injury to lower extremities in the last year and had not suffered from a concussion in the last three months. In addition, female participants indicated they were not pregnant/they did not think they might be pregnant. All participants gave consent to be photographed during the study.

The day of the study, participants arrived at the Buchanan Center for the Performing Arts Dance Studio II at their assigned time. An assistant to the project investigator, lead participants through a 5 minute warm up before teaching them a dance combination consisting of balances and turns. The participants were randomly assigned to learn this sequence with or without the mirror. The combination was taught without words or counts, and participants the maximum amount of time given to the participants to learn the sequence was 15 minutes to allow for a consistent learning environment for all participants. Immediately after learning the sequence, the participants reported to the Buchanan Center of Performing Arts' Lighting Lab. In the lighting lab, they performed the combination in a simulated performance setting with stage lights. Two side lights were

used at an 89% intensity. During their performance, a faculty member was present to fill out a survey evaluating their performance. The survey consisted of questions regarding the participant's pelvic alignment, ankle stability, ribcage placement, ability to balance, appeared confidence in combination, and flow of movement. Each of these questions were based on a three-point scale (poor, moderate, very good). Immediately following the first testing condition, participants filled out a two-question survey indicating how their overall performance was (poor, moderate, very good). This was for them to briefly reflect before learning the second sequence, and for them to reference later when they were asked to reflect more specifically. After completing this survey, the dancers reported back to the assistant in Dance Studio II to learn the second sequence. The participants learned the second sequence with the mirror if they had learned the first sequence without, or without the mirror if they had learned the first sequence with the mirror. The procedure was repeated for the second sequence. Upon completing both testing conditions, the participants filled out an additional survey reflecting more specifically on their performance for both testing conditions. The questions included, execution of technique, proper alignment, ability to balance, confidence in ability, and confidence in combination. These questions were also based on a three-point scale of poor, moderate, and very good. At the end of the survey, they were also able to reflect on their experience in both testing conditions, and were asked what to list benefits and disadvantages of learning a sequence with and without a mirror.

In addition, still photographs were taken to be used in research presentations, publications, and/or by the University of Wyoming.

Results

The quantitative results, which were gathered from the three-point scale, showed that everyone varied in both the faculty evaluations and the self-evaluations. You can see this by looking at tables 1-10.

Table 1-10:

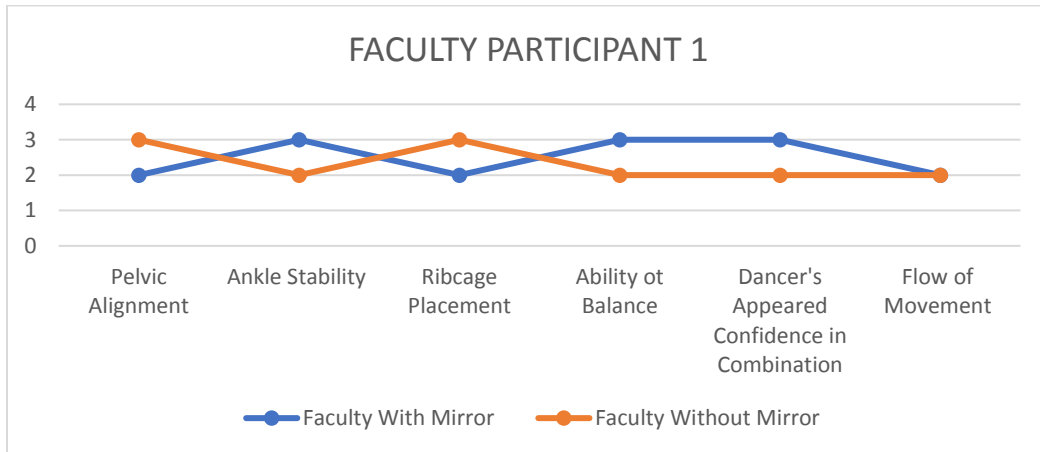


Table 1

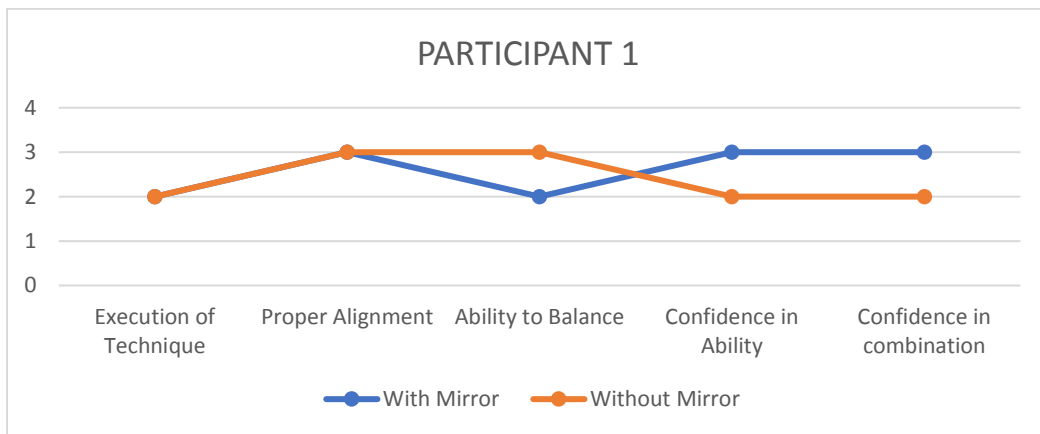


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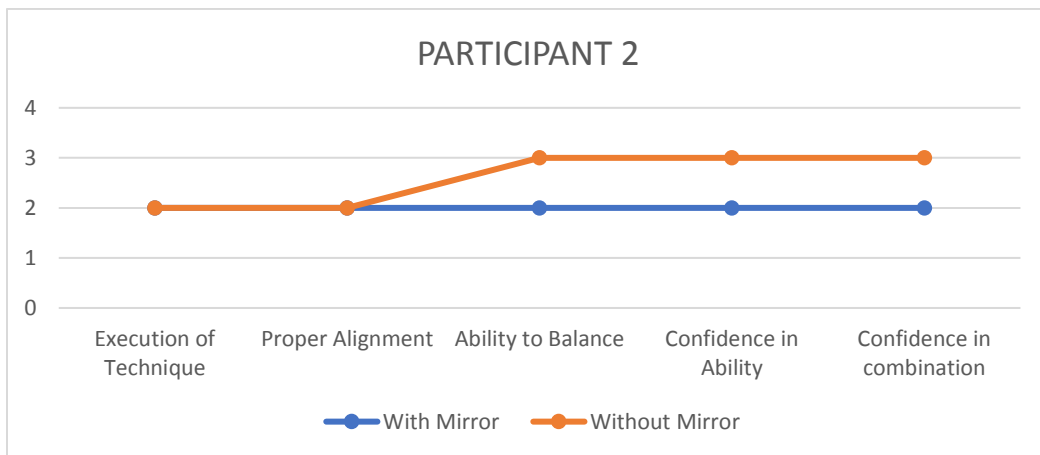


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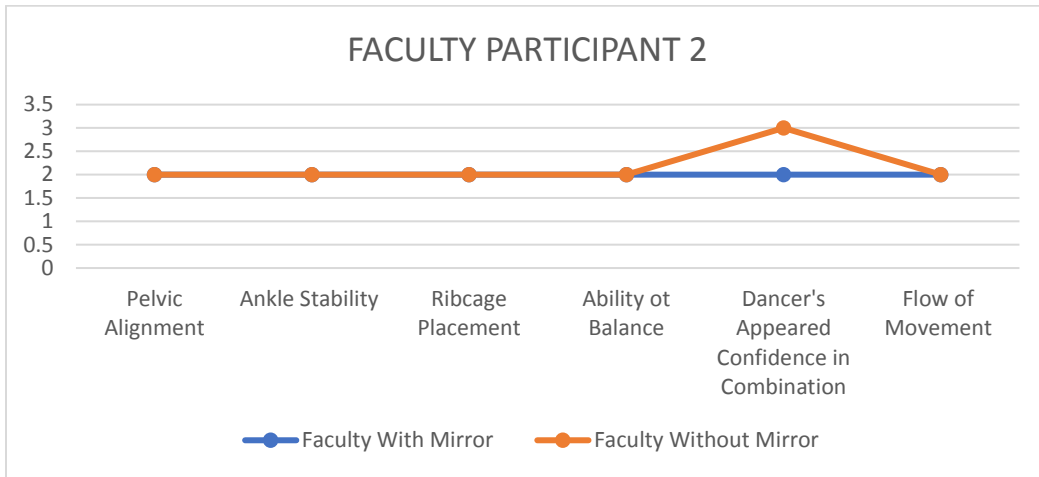


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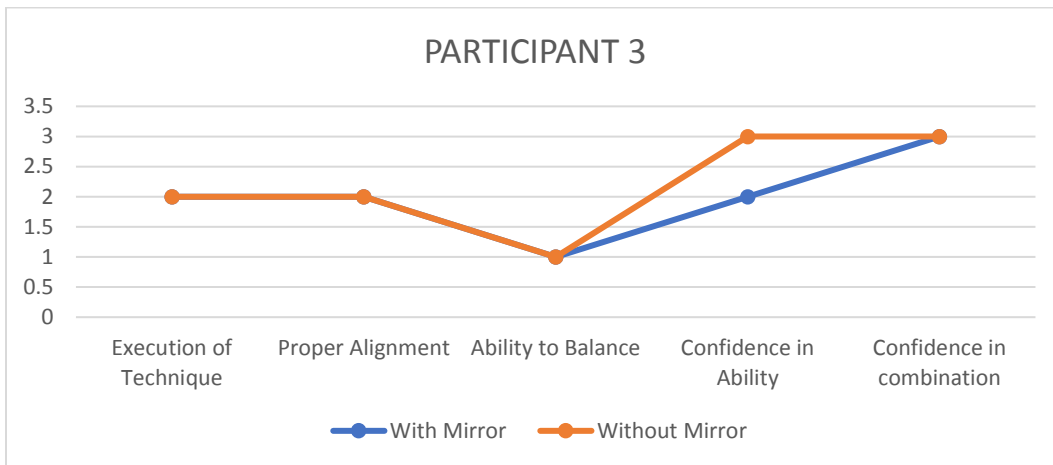


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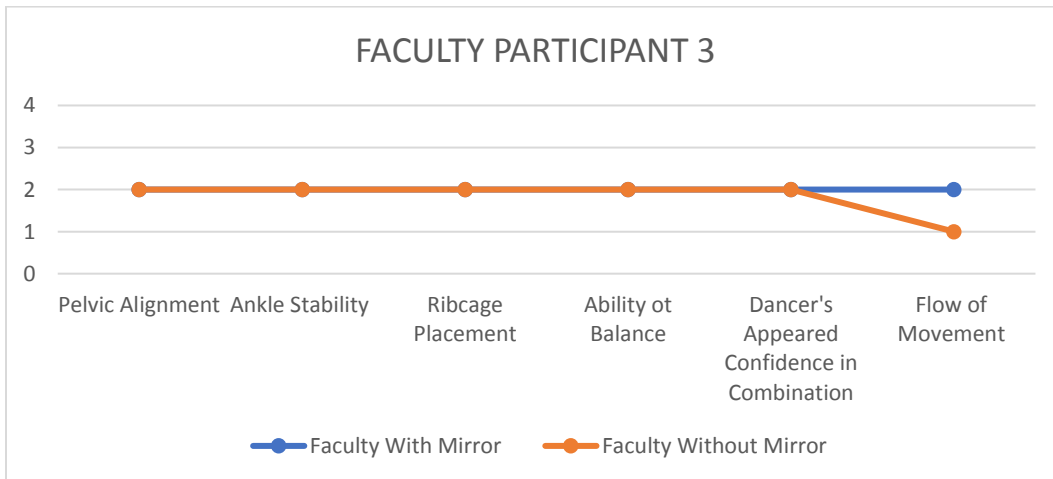


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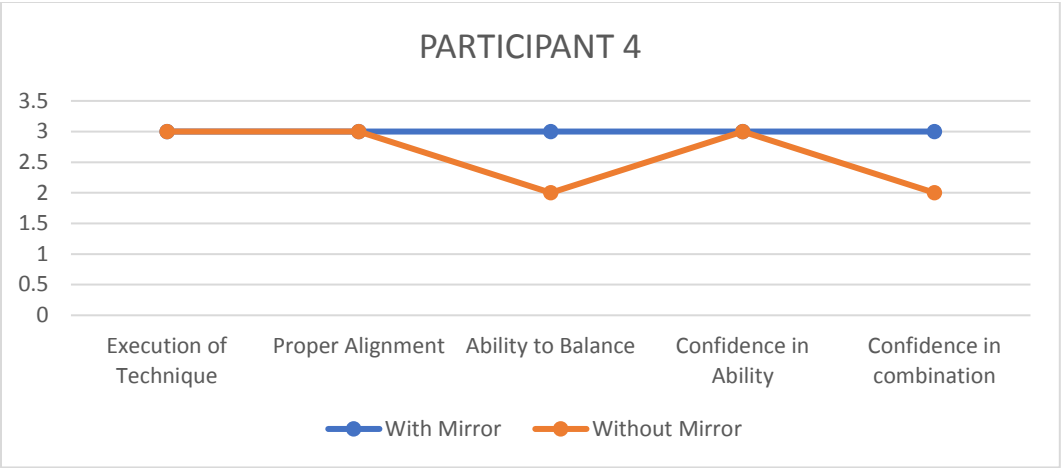


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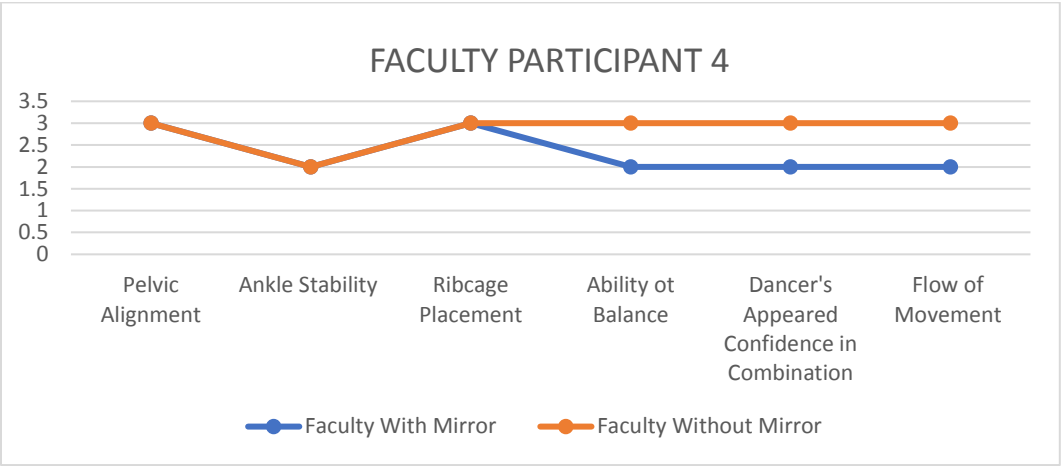


Table 8

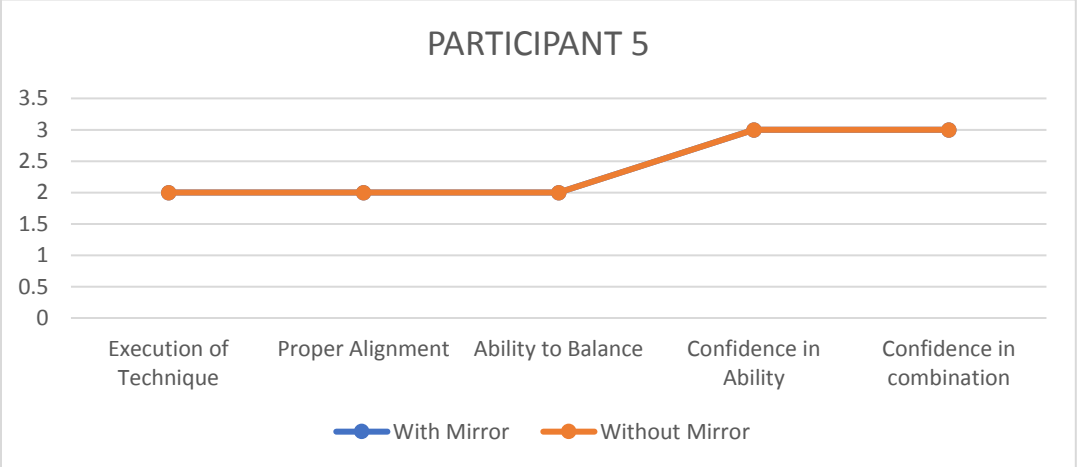


Table 9

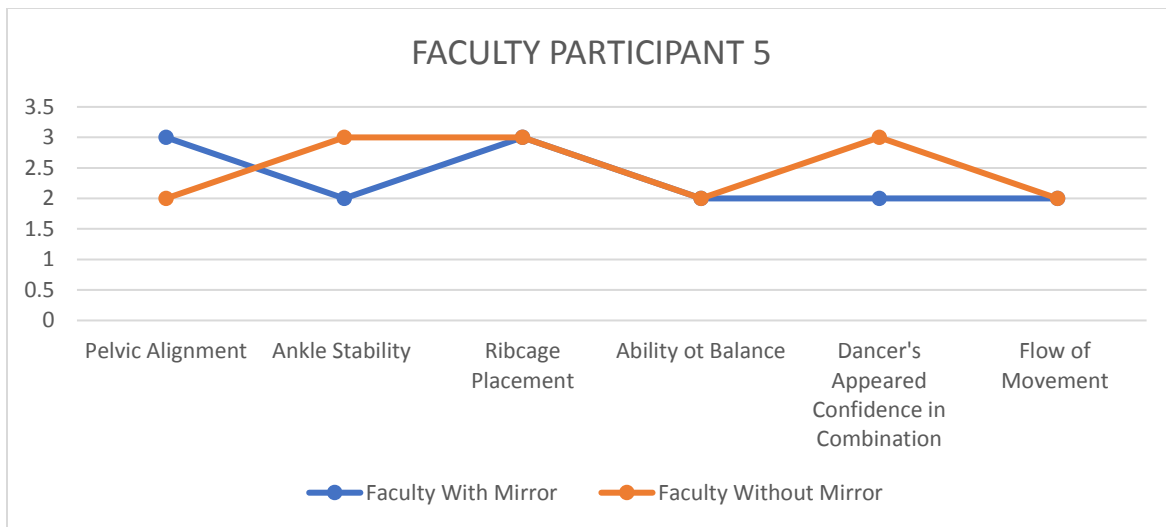


Table 10

As mentioned above, every participant varied in the scores they gave themselves, as well as where they fell on the faculty evaluation. There was an inverse relationship between the scores given by the participant and the faculty scores for participant four (tables 7 & 8). Participant four rated themselves as being more confident and having better balance with the mirror, whereas the faculty rated them higher in both of those categories when they had learned it without the mirror. For participant three, the faculty and participant evaluations were similar, however the faculty rated the participant higher than the participant rated themselves for balance and confidence (tables 5 & 6). Participant five indicated no difference between the two conditions, and gave themselves the same evaluation for both with the mirror and without the mirror. However, the faculty evaluation for participant five varied quite a bit between the two conditions (Tables 9 & 10). For participant two, both the faculty and the participant were consistent on the ratings with the mirror, however, the participant rated themselves slightly higher than the faculty did for the condition without

the mirror (Tables 3 & 4). Lastly, the faculty evaluation for participant one showed an inverse relationship between the two conditions. The faculty rated the participant to have better balance with the mirror, and more confidence with the mirror. The participant showed a similar relationship between the two conditions in their evaluation, however they perceived their balance to be better when learning it without the mirror (Tables 1 & 2).

There were many differences among the participants in their perception of how they did, as well as the faculty's. There were no significant trends, and there was not an overall difference in the average scores of each condition. The average score with the mirror was calculated to be 2.4, and the average score without the mirror was calculated to be 2.44 (Tables 11 & 12).

Table 11:

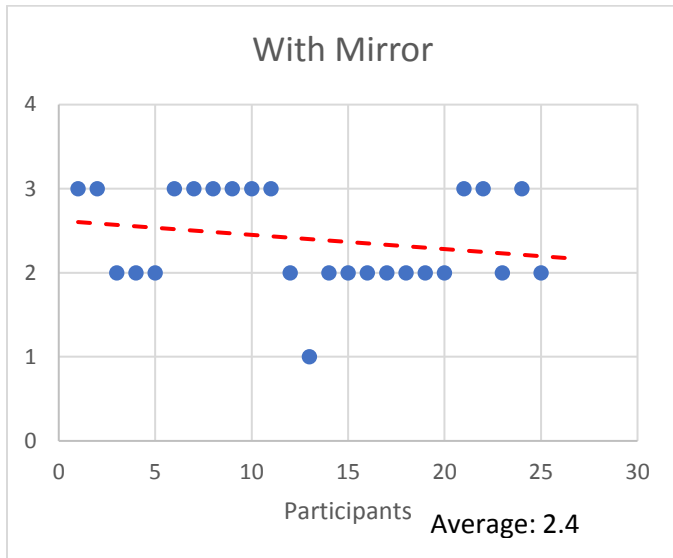
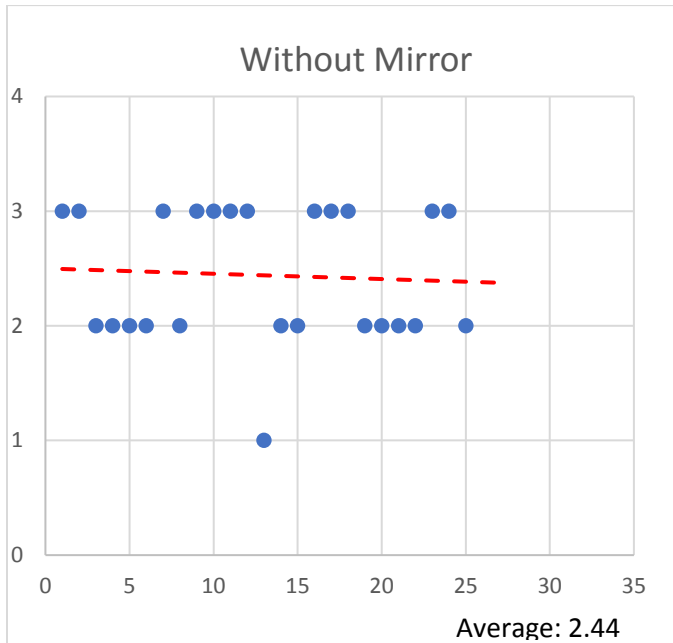


Table 12:



Discussion:

There was not much of a difference in the quantitative data gathered during this study. However, participants did indicate that there were several differences (benefits and limitations) of learning with both the mirror and without out the mirror. Many of the comments given by the participants were in reference to proprioception. Many indicated one of the benefits of learning without the mirror is having an increased feeling of the movement throughout the entire body. As one participant put it, “I was more focused on my

bodily effort and how the movement felt rather than how it looked.” Similarly, when asked what the limitations were when learning it with the mirror, one of the participants said, “I wasn’t feeling it in my own body.” Overall, most of the participants indicated that the benefit of learning the combination without the mirror was being able to feel it in their body.

On a different note, many of the participants indicated that the combination was easier to learn with the mirror. One of the participants said, “I found I was able to see all of the teacher’s body, which helped with seeing total body placement and port de bras.” Similarly, participants indicated that arm pathways and body facings were more difficult to learn when not learning with the mirror. One of the participants also indicated that when learning it without the mirror, they did “not feel confident in how [they] looked.” When this same participant learned with the mirror they said, “Knowing if [their] lines and movement were right because of the mirror” was a benefit because they “could see to fix them.”

Many of the participants indicated that the change of space could have also affected their performance. In this study, participants learned the sequences in a dance studio, and then performed the sequences in the lighting lab. The lighting lab floor was not sprung, and had a slicker floor than the marley floor in the dance studio. In addition, the lighting in the lighting lab was dark, with only two side lights on 89% intensity. One participant said the darkness of the simulated performance setting, along with the “limited space” made it difficult to execute the sequence to the best of their ability. Another participant said, “I found the transition to a smaller space with a slicker floor greatly impacted my performance as well.” If this study were to be conducted again in the future, having the dancers learn the combination in a similarly sized space, with the same floor, would add to the consistency and minimize the variables.

An additional factor that could have affected the results is the scheduling of the participants to come in. Ideally, this study would have all the participants come in on the same day.

However, as everyone's schedules are hectic in a university setting, this study had to take place over two days. Because of this, two of the participants took a ballet technique class before participating in the study. The other three participants did not take a technique class the day they participated. This could have potentially lead to the participants' perceived confidence, technical accuracy, and ability to balance to be different than if they would have participated in the study on a day when they did not take a technique class. If this study were to be repeated in the future, participants would be asked to come in on the same day, or would be asked to come in on a day when all the participants had taken technique class, or when none of the participants had taken a technique class. This would limit the variables, and would help keep each testing condition consistent.

Three of the participants indicated they thought they performed better with the mirror, and two participants indicated they thought they did better without the mirror. However, some of the participants said they partially gave credit to feeling more confident about the specific technical demands of one sequence over the other sequence. Even though the sequences were designed to incorporate similar movements, the structure of the two combinations was different. This factor can vary on the persons' preference and what they feel better doing. This variance between the two sequences could have effected their perceived judgment of how they did in the simulated performance setting.

Overall there were no significant differences or patterns in the data collected, however this study was done with only five participants. In the future, more participants should be used to collect data from a larger pool. Even though there were no trends in the quantitative data, many of the participants agreed there are benefits and limitations for both conditions. More specifically, participants mostly indicated that learning a sequence without the mirror assists with feeling the movement kinesthetically, whereas learning with the mirror assists with learning the sequence correctly.

Conclusion:

It is recognized that this is a limited study on a limited pool of university dance majors. Since there has been little research done on the effect of learning with mirrors, it is a subject area that should continue to be researched. The studies thus far have looked at mirrors in a classroom setting, and have started to provide a glance into the benefits and disadvantages of mirrors. This study was not conclusive in whether learning with mirror assisted or hindered to dancers when they entered a performance setting. Given several other variables that could have affected the results, the researcher believes farther research in this area could be of much benefit to the dance community.

Although the quantitative data gather was inconclusive, the qualitative data suggested that there were benefits and limitations to both conditions. In conclusion, this study found that each participant was different in their preference of learning with or without the mirror. Although they agreed on the limitations and benefits of both, whether one conditions outweighed the other condition, was individualized.

From a pedagogy standpoint, it is going to depend on the individual whether they learn best with or without the mirror. This study recommends that we take this into consideration and try to maximize learning by using both techniques. Teachers should begin to think about the mirror as a tool in the classroom setting more frequently. How can sequences be taught without the mirror, while providing a clear understanding of the entire body involvement of the movement? How can the mirror be used not only for visual cues, but to experience the movement kinesthetically as well? Some recommendations include: encouraging students to use the mirror to visually see and correct errors, while also encouraging them to stop and kinesthetically observe how proper alignment and technique feel.

References

- Karen Dearborn & Rachael Ross (2006) Dance Learning and the Mirror: Comparison Study of Dance Phrase Learning with and without Mirrors, *Journal of Dance Education*, 6:4, 109-115, DOI: 10.1080/15290824.2006.10387323.
- Shantel Ehrenberg (2010): Reflections on reflections: mirror use in a university dance training environment, *Theatre, Dance and Performance Training*, 1:2, 172-184.
- Jonathan P. Farthing, Tibor Hortobagyi, Glyn Howatson, Endre E. Kadar & Tjerk Zult (2013) Role of the Mirror-Neuron System in Cross- Education, *Sports Medicine*, 44:159-178, DOI: 10.1007/s40279-013-0103-2.