56
NUMBERS COUNT
Quantitative research in drama education

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The chapter first considers how historical and contemporary thinking in drama/theater education research has resulted in limited quantitative exploration to date, and how the field would benefit from greater methodological inclusivity. It discusses four quantitative approaches (experimental, quasi-experimental, observational, and survey) and reviews fundamentals such as reliability, validity, statistical significance, and effect size. The chapter closes by sharing the results of several meta-analyses (which summarize the results of multiple related studies) that suggest that drama education impacts student outcomes in a variety of domains.

Drama education advocates often assert that engaging in dramatic activities helps students develop their artistic, academic, and social-emotional competencies. One resource such advocates can draw on is a growing body of quantitative research studies that explore the art form’s impacts in these areas. This type of inquiry is “scientific investigation that includes both experiments and other systematic methods that emphasize control and quantified measures of performance” (Hoy & Adams, 2016, p. 1). Studies employing statistics can complement qualitative and theoretical inquiry in the field by expeditiously providing clear and compelling data in formats that education and policy stakeholders value.

Despite this, quantitative explorations in educational drama research are relatively uncommon, perhaps in part due to historical thinking in the field that continues to the present. John Somers referred to such thoughts in his 1996 overview of research approaches in drama:

An internationally renowned lead speaker at a drama research conference I attended three years ago said there was no place for statistical approaches in drama research. [...] Later in the same address he said that he didn’t understand statistics. We shouldn’t close our minds to the usefulness of particular approaches through ignorance of their potential to help. Fear of the unknown is a recurring theme in drama, but we should not allow for such fear to influence our approaches to research.

(p. 169)

A quarter century later, however, hesitation regarding statistical methods in drama education research remains. When Dani Snyder-Young and I reviewed over 400 peer-reviewed, English-language articles published between 2002 and 2012 concerned with drama education
and applied theater, we found that only 4% of the articles employed quantitative methods exclusively and only 7% employed mixed methods. Comparatively, 37% were qualitative and 31% were conceptual/theoretical (Omasta & Snyder-Young, 2014, p. 13). Most quantitative drama education studies are unpublished, existing only as theses and dissertations.

In this chapter I encourage drama education researchers to consider how the field could benefit from a broader and more robust engagement with quantitative methods and findings. Just as some research questions most lend themselves to qualitative, historiographic, and/or theoretical exploration, other questions can be investigated most fruitfully with quantitative measures. Importantly, I suggest that we should look for ways in which quantitative work can supplement—not supplant—qualitative, theoretical, historiographic, and other investigations.

The chapter begins with a brief history of research in the field that speaks to why quantitative studies may be less prevalent in contemporary drama education research. It next considers reasons why the field would benefit from granting statistical approaches a place at the table alongside other methods. It then discusses the fundamentals of different types of quantitative investigations, providing examples and discussing things scholars should consider if they wish to employ these methods. Finally, it presents a summary of quantitative research findings from the mid-twentieth century through the present.

**A history of drama education research**

Effective advocacy requires data. In the mid-twentieth century, leading practitioners and scholars involved with drama with and for young people began to call for research studies that might demonstrate its value. Story dramatization pioneer Winifred Ward (1950) wrote, “Only by experiment can we determine the child’s interests and types of materials and the modes of presentation which hold him [sic],” creating a need for “actual work with children rather than the projections upon children of pre-formed adults’ views and attitudes” (p. 205). A decade later, Jed Davis (1961) published a prospectus for drama and theater research in which he argued that the field “should not be without concrete evidence to support its work” (p. 277).

According to Kardash and Wright (1986), researchers began conducting experimental research in the 1960s, hoping to corroborate claims about the efficacy of drama education (p. 11). The 1960s and the following decades witnessed an increase in the publication of empirical scholarship, but some scholars expressed reservations about the studies’ caliber and potential to impact stakeholders’ perceptions of drama education. Writing about the work of Geraldine Siks and her contemporaries, Stewig (1972) stated that writings regarding creative drama were “generally hopeful, vaguely uplifting and comforting, but not specific enough to provide direction. [The work] says little to convince superintendents, principals, or harried teachers that creative drama is anything more than a well-intentioned frill that is eminently dispensable” (p. 179). He continues, “It might be helpful if we could cite studies to determine the beneficial effects of creative drama,” and specifically opined that the field needed more “experimental studies,” which at the time were “few and generally unsatisfying” (Stewig, 1972, p. 180).

Vitz (1983) documented an increase in experimental studies between 1971 and 1983. Noting that “education systems concerned with accountability need to validate the claims of the beneficial aspects of creative drama,” she reviewed 32 studies considering creative drama and language acquisition. Even with these studies, however, Vitz (1983) suggested the evidence base regarding creative drama was too sparse, writing, “With so few studies
and even fewer replications, the full range of educational drama and its effects is not being explored” (p. 23).

Furman (1984) surveyed child drama researchers about the types of studies they conducted in 1982–1983 and found that “[t]he highest percentage of research, 41%, was being done in theoretical forms” (p. 31). Of these studies, 12% were surveys, 22% were historical, and 25% were experimental. Furman (1984) advocated for further survey and experimental research studies, writing, “a shift away from purely theoretical exploration could improve the information gathering process necessary to assess and enhance the effect of child drama programs” (p. 32).

Several reviews of the literature from the 1980s point to a variety of quantitative studies that took place in this period (Conrad, 1992; Kardash & Wright, 1986; Krzys, 1991). O’Farrell (1993) went so far as to state that “in recent years, quantitative research has been a dominant approach followed in North America” (p. 29). At the same time, this period saw a broadening of the types of research the field valued, as drama education researchers began to embrace qualitative approaches. At the 1989 International Drama Education Research Symposium, “qualitative methodologies predominated, indicating a rapid and dramatic swing of the pendulum from the [quantitative] emphasis at the beginning of [the 1980s]” (Wilkinson, 1989, p. 17).

As qualitative inquiry gained currency in the field, an unfortunate false binary developed that suggested these newer approaches were dichotomous to quantitative methods. By the turn of the twenty-first century, qualitative inquiry largely overshadowed quantitative work, as some drama education researchers expressed ontological and epistemological concerns about the supposed assumptions of quantitative methods. Some believed that the use of statistical methods required adhering to positivist assumptions, such as that claims about social reality could be “proved.”

In actuality, few, if any, drama education research studies conducted over the past several decades were are grounded in positivism. Contemporary statistical studies are more likely to be grounded in postpositivism, a paradigm that emerged in the mid-twentieth century and largely eclipsed the positivism that came before it. Following the work of thinkers such as Popper (1959), postpositivists recognize that no theory can ever be proven “true.” Rather, they aim to put forward warranted assertions and hypotheses that can be falsified or disconfirmed through experimentation. As Hoy and Adams (2016) note,

When using the scientific approach, no explanation is final, because a better one may be devised at any time; science is open. Nothing is irrevocably proved; in fact, those with a scientific temper stay clear of the term proved when talking about findings in educational or psychological research.

(p. 2, emphasis in original)

Nevertheless, some assessments of the state of drama research have been particularly bleak. Introducing his collection on research methods in drama education, Taylor (1996) proclaimed, “We are living in a desperate time in arts education” (p. 1). He lamented that “a new conforming scientism” had begun to “breed a purblind complacency” in research. He asserted that there was a “dangerous training climate” in the field and cited what he called Maxine Greene’s “suspicion of deadly research” (pp. 1–2). He further warned of the “danger” of “research design that draws on standard notions of empiricism,” worrying that “drama and arts educators may irrevocably misrepresent their work if they mindlessly adopt [empirical approaches]” (pp. xi–xii).
Reflecting on this period, Klein (2016) posited that as the field embraced “postmodern” perspectives in the 1990s, “empiricism was (and still is) roundly condemned as an evil ‘positivist’ methodology because any claim of ‘objective truth’ and ‘empirical facts’ were (and still are) automatically deemed ‘false’ as existential impossibilities and illusionary figments of modernist’s imaginations” (p. 116). Accordingly, “any use of numbers for quantifiable analyses, even simple descriptive statistics, was castigated” (p. 116).

As is the case with all research methodologies, quantitative approaches can benefit from well-informed critique. However, wholesale rejection of quantitative methods, solely because they are quantitative, may be pragmatically unhelpful in terms of moving the field forward and exploring a wide range of research questions. For example, if we wish to discuss inequitable access to drama education for students from lower-SES families, it would be helpful to first establish the percentage of young people from various backgrounds who receive drama instruction in their schools. Before qualitatively exploring why inequities exist (a question that might be addressed with qualitative methods), we must first establish that systemic inequities actually exist, a task best suited to quantitative measures.

Valuation of quantitative approaches

Education is a numbers-driven field in many countries. Writing in 1996, Errington posited that while researchers may prefer qualitative methods such as ethnography, the fact that drama education is situated under the umbrella of education more generally may constrain the types of methods researchers are able to employ (p. 23). Today there are substantial bodies of qualitative education research, but some education leaders and policymakers still rely primarily on quantitative measures when making decisions.

Research that includes quantitative elements is also increasingly prevalent in the arts. Professional theater leaders and associations, as well as funders in the arts, increasingly utilize statistical data, even in areas not related to education. Theaters rely on publications such as the Theatre Communications Group’s annual *Theatre Facts* (e.g., Voss et al., 2019) to understand the fiscal state of the field. While finances may be an obvious topic to study quantitatively, theaters are now using statistical work to explore much more. In one notable example, 18 professional theaters participated in a study exploring the intrinsic impacts of live theater (Brown & Ratzkin, 2012). The study demonstrates that in addition to often-cited extrinsic impacts of theater, such as its effect on the local economy, theater companies can learn about the intrinsic impacts of their work. That is, through quantitative survey research theaters can explore the way plays affect audience members through captivation, intellectual stimulation, emotional resonance, aesthetic enrichment, and social bridging and bonding.

Research funders in the arts also often value quantitative studies. For example, while the National Endowment for the Arts (NEA) in the United States accepts proposals employing a variety of research methods, funding at the highest award levels is reserved for quantitative work, specifically experimental or quasi-experimental studies involving arts intervention groups and non-arts control groups (NEA, 2020).

Weltsek et al. (2014) assert that “quantitative data gathering and analysis [are regarded as] the sole markers of efficacy” (p. 66). They argue that the solution to this is not necessarily for scholars in the field to produce more quantitative studies but rather that “the larger challenge may be a societal move toward a more balanced and inclusive understanding of assessment” that values a variety of types of research (p. 66). These objectives are not mutually exclusive. As researchers we can collectively work to produce quantitative reports that may
have greater currency in education in the short term while also simultaneously striving to enhance decision makers’ perceptions of qualitative work in the long term.

All said, the field faces challenges when it comes to quantitative research. In most Western nations, a strong majority of scholars in theater and drama receive no preparation in statistical methods as part of their doctoral training given the discipline’s emphases on qualitative, theoretical, and historiographic approaches. Learning a new methodology can seem daunting. Fortunately, we need not become a field of advanced statisticians to engage with quantitative work, though we can and should develop basic literacy in all forms of research; the next section of this chapter provides an overview of methods. If we are interested in conducting our own quantitative work, we can audit classes or partner with colleagues in other disciplines with stronger statistical training to engage in collaborative research.

**Types of quantitative research**

There are four major types of quantitative studies: experiments, quasi-experiments, surveys, and observational studies. This section briefly introduces each type and provides examples of each.

**Experiments**

Experimental research is designed to demonstrate cause and effect. For example, a researcher may want to explore if participating in creative drama sessions causes students to earn higher scores on a measure of creativity. Experiments seek to control one or more independent variables, such as whether or not children participate in drama sessions, in order to determine if and how they affect other dependent variables, such as the children’s creativity. True experiments must include three elements of control: randomization, manipulation, and comparison/control (Privitera & Ahlgrim-Delzell, 2019, p. 187). This means that there must be a variable that researchers can control (e.g., if a child participates in drama or not). In addition to the group of participants who experience the intervention, there must be at least one other group of participants who do not, or who experience a different condition, so that researchers can compare the groups. Participants must be assigned to conditions randomly, that is, each participant must have an equal chance of being assigned to each group.

An example of an experiment is Goldstein and Lerner’s (2018) randomized controlled trial exploring how engaging in dramatic pretend play games (DPPG) affected the social and emotional skills of 4–5-year-old, low-SES children. The 97 children who participated in the study were randomly assigned to one of three conditions. The first played DPPG over the course of 24 thirty-minute sessions. Meanwhile, children in two control conditions engaged in play with toy blocks or story time over the same number of sessions. The researchers tested all of the children on an array of social awareness skills, self-management skills, and relationship skills both before and after the series of play sessions. The researchers found that the children who played DPPG demonstrated a significant increase in emotional control skills, while the children in control conditions did not. Participating in DPPG did not relate to other changes tested for, such as theory of mind, altruism, social comforting, or helping behavior (Goldstein & Lerner, 2018, p. 7).

While studies such as that of Goldstein and Lerner’s randomize conditions at the individual child level, randomization may also happen at the classroom level; that is, all of the students in one group of classrooms experience an intervention, while none of the students in another group of classrooms do. For example, Walker et al. (2011) considered how
integrating theater into language arts and social studies curricula affected fourth- and fifth-grade students’ cognitive, precognitive, and prosocial development. In their study, students in 28 classrooms were randomly assigned to receive arts-integrated instruction using drama strategies, while students in 28 other control classrooms engaged in standard, text-based instruction. Some of their findings include that students who participated in the arts-integrated classes were significantly more likely to pass a state language arts exam; however, students in the control group were significantly more likely to earn a final marking period grade of B or above in social studies. Students in the arts integration group were more likely to grow in the procognitive domain, though only to a small degree. Students who experienced the arts-integrated lessons were also significantly more likely to hold favorable views about the arts than their peers in the control group.

**Quasi-experiments**

It is not always possible to meet all of the requirements necessary to conduct a true experiment. In particular, randomization is not always feasible. For example, a researcher might partner with two teachers interested in having their students participate in a study. The easiest way to proceed would be to have one classroom of students experience an intervention, while another does not. In this model, the participants are not randomized, and thus, there may be existing significant differences between the two groups that impact the results. However, the researchers may not have the resources necessary for randomization. Studies of this nature – ones that resemble experiments but do not meet all of the requirements, such as randomization – are referred to as quasi-experimental.

An example of a quasi-experiment is Lee et al.’s (2019) study exploring the use of strategies known as “rehearsal room practices” (RRP) in ninth-grade language arts classes. RRP s are rehearsal techniques used by ensemble-based theater companies, including the Royal Shakespeare Company, that “involve all participants as actors and evaluators who are aiming to generate multiple layers of representations in the service of deepening individual and shared meaning of a focal text” (Lee et al., 2019, p. 73). Compared to students who were taught using traditional methods, “students who experienced RRP while studying Shakespeare’s plays were more motivated, saw Shakespeare’s plays as relevant to their lives, and wanted to read additional challenging texts at the end of the program,” (Lee et al., 2019, p. 70) suggesting that RRP s may be effective when teaching complex texts.

**Observational studies**

Both experiments and quasi-experiments rely on researchers being able to control some of the variables at play. This is not always possible. For example, some schools may be willing to allow researchers to observe teachers and students as they go about their normal days but may not permit the researchers to stage an intervention. In such cases, researchers may conduct observational studies in which they record and analyze data about participants without attempting to influence those participants. The difference between these studies and, for example, ethnographies, is that these studies use statistics to quantitatively assess the activities observed.

For example, Lorenzetti and Kruger (2020) studied four teaching artists (TAs) who led 13 drama sessions with kindergarten students. The researchers never interacted with the participants, but rather viewed video of the TAs teaching two of the lessons: the first and the last sessions of the series. They observed and recorded the frequency and types of classroom management strategies the TAs employed. They found “a statistically significant difference
reduction in the amount of directive behavior management employed by the TAs between Lessons 1 and 13” (Lorenzetti & Kruger, 2020, p. 16). This may suggest that the children needed less directive management by the last lesson because their work over the series of drama classes helped them self-regulate more effectively.

**Surveys**

Another common type of quantitative study is the survey. Surveys aim to learn about the characteristics of a population of people by posing questions with quantifiable answers to members of that population. In some cases, it is possible to survey every member of a population. When this occurs, the survey is referred to as a census, and it uses descriptive statistics to report about the population. Usually, however, it is difficult or impossible to survey each person in a population. Many surveys therefore pose questions to a select sample of people and use inferential statistics to estimate the characteristics of the total population from which the sample is drawn. This is advantageous because researchers can make reasonable estimates about very large populations from much smaller samples. For example, researchers may make estimates about a population of 100,000 people from data about a random sample of just 383 randomly selected people from that population (with 95% confidence and a 5% margin of error). The sample must be truly random in order to employ inferential statistics – every member of the population must have an equal chance of being included in the sample.

Achieving a random sample can be difficult. For example, I (2012) conducted a survey of high school theater teachers and administrators from across the United States. The study was initially designed to employ random sampling, but the response rate from the randomly selected schools was too low to draw conclusions about the population. As such, I modified the study by inviting all schools in the population to participate, and over 1,200 did. Because schools opted in to participating, however, it was not possible to generalize the results to make estimates about all of the schools in the total population.

Nevertheless, I was able to use descriptive statistics – those that do not make inferential claims – to make interesting observations about the schools that opted in. The survey covered a broad array of topics, from administrator and teacher perceptions of the value of theater arts education to the qualities that administrators seek when hiring theater teachers to the social issues high school theater programs do (and do not) address. Some of the findings speak to the value of theater education, such as that 99% of the administrators and teachers surveyed believed the theater programs at their schools enabled students to grow in self-confidence. Other findings pointed to challenges facing the field, such as that 93% of the teachers surveyed indicated their race was “white, not of Hispanic origin,” despite that fact that only 61% of the students enrolled at the schools in which these teachers taught were white.

**Things to consider with quantitative research**

In order to review quantitative research reports, it is helpful to have a degree of familiarity with the methodology. While a comprehensive overview of quantitative methods is beyond the scope of this chapter, there are some key terms readers should be familiar with.

**Reliability and validity**

Most scholars conducting statistical research in social policy agree that quantitative studies should demonstrate that the data/measurements they gather are both reliable and valid.
Privitera and Ahlgrim-Delzell (2019) explain that “reliability is the consistency, stability, or repeatability of one or more measures or observations” (p. 107). Types of reliability include:

- Test–retest reliability: Do measurements of variables remain consistent over time?
- Internal consistency: When multiple variables measure the same construct, are the data gathered from the different variables consistent?
- Equivalent forms reliability: If data are collected using different instruments that measure the same constructs, do the different forms consistently measure the construct?
- Interrater reliability: If multiple scorers rate a variable, do they score measures similarly?

Validity is “the extent to which a measurement for a variable or construct measures what it is purported or intended to measure” (Privitera & Ahlgrim-Delzell, 2019, p. 110). Types of validity include:

- Construct validity: Does a variable actually measure what it is supposed to measure?
- Criterion-related validity: Is there a concurrent or predictive relationship between the data obtained from an instrument and data from other instruments that measure the same construct?
- Content validity: Do the variables measured adequately capture the construct being investigated?

**Statistical significance and effect size**

When researchers report the results of experiments and quasi-experiments conducted to determine the efficacy of interventions, they should indicate the effect of their intervention through both statistical significance and effect size. A finding is considered statistically significant when it is unlikely to be due to chance or sampling error. In social science fields like education, a finding is typically considered significant when its \( p \) value is less than 0.05; a \( p \) value is a measure of the probability that a finding is the result of chance alone. That a finding is statistically significant, however, does not necessarily imply that it is important or meaningful from a practical perspective. A finding’s effect size speaks to the magnitude of impact because it takes into account the sample size and variance. Cohen (1988) proposed a measure of effect size (\( d \)) that ranges from 0 to 1. An effect size of 0 indicates no effect, .2 a “small” effect, .5 a “medium” effect, and .8 a “large” effect.

**Meta-analyses of educational drama research**

This chapter closes with an overview of the findings of quantitative drama education studies since the 1960s. Researchers can synthesize the results of multiple quantitative studies that consider similar research questions by conducting meta-analyses. Meta-analyses take into account each study’s sample size, effect size, and statistical significance. Scholars have conducted several meta-analyses considering drama education programs’ impact in domains such as academic achievement, self-concept, and twenty-first-century skills. Table 1 below reports the results of these studies. The right-hand column indicates the mean effect size of each study’s findings in the domains indicated. Again, an effect size of 0.2 is considered small, 0.5 medium, and 0.8 large. If the findings in a domain were not statistically significant, three dashes appear in the column.
For example, the study by Kardash and Wright (1986) in the first row collectively considered drama’s impact on reading, oral and written communication, person-perception, and drama skills. It reported a statistically significant effect size of 0.67, a medium-large effect. The study by Conrad and Asher (2000) assessed drama’s impact on students’ self-concept and self-esteem, and did not report a statistically significant result. The study by Podlozny (2000) and both studies by Lee et al. (2015, 2020) reported drama’s impact in discrete domains. As such, I indicate the effect size reported for each domain in these studies.

As Figure 56.1 indicates, meta-analyses of the literature suggest that drama education strategies affect student outcomes across an array of, but not all, domains. Because each meta-analysis considered a different set of studies (with some overlap), it is not surprising that there is some variability in their findings. For example, of the two meta-analyses assessing twenty-first-century skills, one reported a significant, medium-large effect, but the other did not report significant findings. In other areas the findings are more consistent, and we

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<th>STUDY</th>
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¹ The 2015 and 2020 meta-analyses report multiple measures of effect size (d), including a set of findings in which figures were adjusted to consider preintervention scores of the outcomes as well as unadjusted figures. Given the quasi-experimental nature of most of the studies reviewed, I include here the adjusted figures as Lee et al. (2015) suggest these data may be less biased. The 2015 study reported figures accounting for fixed error or random error. Given that the interventions, while all related to drama, considered a range of approaches, I include here measures that account for random rather than fixed error.

Figure 56.1  Results of meta-analyses considering drama education
might be more confident making claims related to these domains. For example, nine of the ten meta-analyses considering literacy-related domains reported statistically significant mean effect sizes. On the other hand, neither of the two meta-analyses considering self-concept reported statistically significant findings. It does not necessarily follow that drama-based literacy interventions will almost always be effective or that dramatic interventions targeting self-concept will not, but the summative data from these meta-analyses can help us as we develop future research studies and consider the claims we make about what drama education seems to be able to do well.

Overall, our field would benefit from greater attention to and additional conduct of studies that incorporate quantitative measures. Different research questions best align with different modes of inquiry. Incorporating statistics in a study need not mean abandoning qualitative and other approaches. In fact, we might most benefit from carrying out mixed-methods studies that deliberately blend multiple methodologies, thus benefiting from the strengths of each approach incorporated.

We should recognize that many decision makers in both theater and education value quantitative findings. If we wish to influence these individuals’ thinking, we ought to consider projects that incorporate the type of measures they find most meaningful. Again, this does not imply that we should disregard other approaches. We can conduct quantitative work while concurrently working to elucidate the value of qualitative inquiry. By broadening our methodological literacy, we will better position ourselves to create impactful scholarship.

Notes

1 Here Ward summarizes an argument offered by John Anderson, Director of the University of Minnesota’s Institute of Child Welfare.
2 Replication studies, which recreate the conditions of earlier to work determine if the findings recur, continue to be exceptionally rare in educational drama research.
3 While this call may have helped generate an increase in quantitative approaches, the phrasing was not ideal. Calls to move “away from” theoretical research in order to promote quantitative approaches may have contributed to the misconception that valuing one mode of inquiry requires devaluing others.

References