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Associations of Teaching Innovation with Acting Skill Development in Chinese Acting Programmes: Psychological Flexibility Mediation and Direct-Effect Moderation by Teaching Strategies in a Cross-Sectional Survey

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Abstract. Using a cross-sectional survey analysed with partial least squares structural equation modelling (PLS-SEM), this study examined whether teaching innovation was associated with acting skill development in Chinese acting-training settings, whether psychological flexibility mediated that association, and whether teaching strategies moderated the direct teaching innovation-acting skill development path. The survey yielded 350 valid responses from conservatories, university programmes, vocational colleges, and private studios; each focal construct was measured with nine reflective 7-point items. Data were analysed in SPSS and SmartPLS using PLS-SEM, including measurement-model assessment, bootstrapped testing of the indirect effect with 5,000 resamples, a latent interaction term, and simple-slopes analysis. Teaching innovation was positively associated with acting skill development (total effect $c = .383$, $p < .001$) and retained a significant direct association after entering psychological flexibility ($\beta = .206$, $t = 4.29$, $p < .001$). Teaching innovation predicted psychological flexibility ($a = .467$, $t = 11.90$, $p < .001$), psychological flexibility predicted acting skill development ($\beta = .379$, $t = 8.30$, $p < .001$), and the indirect effect was significant (.177, 95% CI [.129, .234]), indicating partial mediation. Teaching strategies positively moderated the direct association ($\beta = .185$, $t = 3.96$, $p < .001$); the simple slope was approximately .00 at low teaching strategies and .369 at high teaching strategies. The model explained $R^2 = .272$ of acting skill development, rising to $R^2 = .300$ with the interaction. The study contributes evidence that innovation in acting education is linked to skill development partly through psychological flexibility and more strongly under strategy-rich teaching conditions. In plain terms, new teaching methods appear to help actors develop most when they also build students' psychological adaptability and are paired with strong, strategy-rich instruction rather than deployed on their own.

Keywords: teaching innovation, acting skill development, psychological flexibility, teaching strategies, PLS-SEM, Chinese performing-arts education.

Introduction

Research Problem

Acting education has entered a period of marked pedagogical change. Although acting remains an experiential and embodied discipline, wider higher-education pressures toward more dynamic, technology-enabled, and learner-responsive instruction have reached the rehearsal room. In acting programmes, Teaching Innovation now appears in forms such as AI-enhanced acting simulations, competency-based instructional models, and hybrid teaching, all of which promise stronger engagement and more demonstrable performance outcomes (Goodchild & Speed, 2018; Walmsley, 2013). Yet the core question is empirical rather than aspirational. Because Acting Skill Development depends on public performance, emotional expressiveness, and mastery of technique, novelty in delivery cannot be assumed to produce better acting. The field therefore needs evidence on whether innovative pedagogy improves the performance capacities that acting training is meant to develop.

This question matters because innovation changes the underlying cycle of actor training. Digital and simulated environments allow students to rehearse, record, review, and refine performance in ways that were previously difficult to scale, while hybrid formats and adaptive platforms promise more individualised pacing and feedback (Allain, 2019; Kolenko, 2025; Shinde et al., 2026). In principle, these changes fit a

discipline in which learning is built through repeated, situated practice rather than abstract exposition. But acting is not a purely technical domain. Students must also sustain emotional truth under pressure, regulate anxiety, and remain responsive when rehearsal or live performance does not unfold as planned (Lee et al., 2015). Any explanation of how Teaching Innovation influences Acting Skill Development must therefore extend beyond instructional design alone.

This is where Psychological Flexibility becomes central. Psychological Flexibility refers to the capacity to remain in contact with the present moment while adapting behaviour in line with valued goals, even under stress (Kashdan & Rottenberg, 2010; Hayes et al., 2019). For actors, it underpins engagement with emotionally demanding roles, persistence in the face of critique, and recovery when scenes or performances become unstable. Scholarship on acting and drama pedagogy increasingly suggests that skill develops through flexible, supportive, and learner-responsive teaching rather than through repetition alone (Goldstein et al., 2020). If so, innovative teaching may matter partly because it strengthens the internal adaptability through which students convert demanding practice into competence. The issue is not only whether Teaching Innovation works, but whether it works by enhancing Psychological Flexibility.

Evidence from adjacent literatures makes such a mechanism plausible. Improvisational and drama-based approaches have been linked to acceptance, creativity, adaptability, and psychological well-being (Schwenke & Dshemuchadse, 2020; Felsman et al., 2019; Irugalbandara, 2020), and to socio-emotional development, collaborative capacity, resilience, communication, and emotional intelligence across performance and adjacent educational settings (Celume et al., 2019; Celume et al., 2020; Goldstein, 2024; Toivanen et al., 2011; Panagiotopoulou, 2018; Horasan-Doğan & Cephe, 2020; Hou, 2026). Taken together, these studies support the proposition that the interaction between pedagogy and learner psychology is central to advanced performance skill; what they do not yet provide is a formal test of Psychological Flexibility as the pathway linking Teaching Innovation to Acting Skill Development in acting education itself.

A second unresolved issue concerns Teaching Strategies. In the acting studio, role-play and improvisation, instructor feedback and coaching, and exposure-based practice are not interchangeable methods; they operate through different channels of learning and adaptation. Role-play and improvisation draw students into embodied character construction, feedback and coaching convert expert observation into specific performance adjustments, and exposure-based practice helps students manage performance anxiety through graduated immersion (Lee et al., 2015; Goldstein et al., 2020). This distinction matters because the same innovation may be transformative in one classroom and ineffective in another depending on how it is delivered. The literature often assumes that strong Teaching Strategies amplify the value of innovation, but it has rarely tested that claim quantitatively as a moderation effect in acting education. Without such evidence, institutions cannot know whether investments in digital rehearsal systems, simulation-based training, or hybrid delivery are broadly effective or chiefly effective in strategy-rich teaching environments.

Research Focus

The gap, then, is not a simple lack of studies on isolated variables. It is an integration problem. Research on Teaching Innovation in the performing arts is energetic but still heavily conceptual, prototype-driven, or practice-led, especially with respect to digital and immersive tools in actor training (Walmsley, 2013; Allain, 2019; Kolenko, 2025). Research on Psychological Flexibility is methodologically mature, but it has developed mainly in clinical and general educational settings rather than in the acting studio (Kashdan & Rottenberg,

2010; Hayes et al., 2019). Research on Teaching Strategies in acting pedagogy is likewise rich in qualitative insight but rarely treats strategy as a quantitative boundary condition (Goldstein et al., 2020; Lee et al., 2015). As a result, acting education still lacks integrated evidence on three linked questions: whether Teaching Innovation directly enhances Acting Skill Development, whether Psychological Flexibility explains part of that relationship, and whether Teaching Strategies strengthen or weaken it. The problem is compounded when studies omit relevant controls or avoid model-based analysis, which, for relationships combining pedagogy, learner psychology, and performance outcomes, is best addressed by estimating direct, indirect, and interaction effects within a single framework (Hair et al., 2019; Kline, 2015).

Research Aim and Research Questions

This article addresses that gap in the context of Chinese performing-arts education, where programmes face pressure to modernise pedagogy while preserving the experiential core of actor training. The study aims to test an integrated model of how Teaching Innovation relates to Acting Skill Development, with Psychological Flexibility specified as a mediating mechanism and Teaching Strategies as a moderating boundary condition, while accounting for demographic and training-context controls. Four research questions guide the study:

- RQ1. Is Teaching Innovation positively associated with Acting Skill Development in Chinese acting-training settings?
- RQ2. Does Psychological Flexibility mediate the association between Teaching Innovation and Acting Skill Development?
- RQ3. Do Teaching Strategies moderate the direct association between Teaching Innovation and Acting Skill Development, such that the association is stronger when effective strategies are present?
- RQ4. Do the focal relationships remain substantively intact after accounting for gender, age, study level, training duration, and institution type?

Drawing on 350 valid responses analysed with PLS-SEM, this design brings together strands of literature that have typically been examined separately and tests them against acting-specific outcomes rather than generic educational indicators. The article makes three contributions. First, it provides quantitative evidence on the relationship between Teaching Innovation and Acting Skill Development in a field where claims about innovation have often outpaced measurement. Second, it identifies Psychological Flexibility as a mechanism through which innovative pedagogy may translate into better performance, extending flexibility research into acting education rather than leaving learner adaptation as a background concern. Third, it clarifies the conditions under which innovation is more likely to matter by modelling Teaching Strategies and a defined set of demographic controls within the same empirical framework. Together, these contributions shift the discussion from whether acting pedagogy should modernise in principle to how innovation, learner psychology, and instructional strategy combine to shape performance development in practice.

Literature Review: Theory and Hypotheses

Teaching innovation is increasingly prominent in acting education, yet evidence on its acting-specific effects remains thinner than the surrounding design discourse. Performance pedagogy has produced strong conceptual arguments for hybrid delivery, competency-based instruction, and digitally enhanced rehearsal, while work on VR, AR, and AI has begun to prototype new forms of actor training (Goodchild & Speed, 2018; Walmsley, 2013; Cziboly & Bethlenfalvy, 2020; Kolenko, 2025; Aldaghlawy, 2024). What remains underdeveloped is a model-based explanation of how such innovation translates into acting skill development within formal programmes, and under what conditions that translation is strongest.

The model integrates three compatible perspectives. Constructivist learning theory argues that competence is constructed through active, authentic, and scaffolded engagement rather than passively received (Jonassen, 2019). A skill-acquisition account of acting treats performance as an embodied craft refined through enactment, feedback, and re-performance (Celume et al., 2019; Goldstein, 2024; Toivanen et al., 2011). Psychological flexibility theory explains the internal capacities that allow learners to stay engaged with emotionally demanding practice rather than avoid it (Hayes et al., 2019; Kashdan & Rottenberg, 2010). Together, these perspectives imply that innovation should enrich acting practice, but that its benefits depend on students' ability to regulate emotion, adapt to performance demands, and reframe setbacks, and on the strategies through which instructors scaffold that process. Acting skill development is therefore treated as a multidimensional outcome comprising stage presence, emotional range, and mastery of performance techniques rather than a fixed talent or a single skill score (Goldstein et al., 2020; Shyp et al., 2021; Lewis & Bird, 2019; Bortnyk, 2021).

Teaching Innovation and Acting Skill Development

Teaching innovation is conceptualised here as a multidimensional instructional shift encompassing AI-enhanced acting simulations, competency-based instructional models, and hybrid teaching in drama education, which act on the learning process in complementary ways (Goodchild & Speed, 2018; Walmsley, 2013). AI-enhanced simulations and related digital environments expand the number, variety, and repeatability of practice situations available to students (Aldaghlawy, 2024; Kolenko, 2025; Bozia, 2018). Competency-based models make performance more explicit as an object of assessment by tying learning to demonstrable capabilities rather than time served (Goodchild & Speed, 2018). Hybrid teaching reorganises scarce studio time by relocating transmissible material outside the rehearsal room and preserving face-to-face hours for embodied practice, coaching, and feedback (Cziboly & Bethlenfalvy, 2020). These innovations should matter in acting because they enrich the experiential cycle through which performance competence is built.

That experiential logic is especially important in performance training because rehearsal is otherwise fleeting. Recording, simulation, and replay turn ephemeral performance into a durable artefact that can be reviewed and refined, thereby increasing the volume and reviewability of expressive practice (Allain, 2019; Kolenko, 2025). This should support all three dimensions of acting skill. Stage presence is cultivated through repeated attempts to sustain attention and conviction under observation (Shyp et al., 2021; Berelet, 2026). Emotional range develops through structured opportunities to generate, modulate, and revisit affective performance (Celume et al., 2020; Damodaran et al., 2026). Technical mastery in voice, movement, and

timing depends on deliberate repetition supported by visible performance feedback (Lewis & Bird, 2019; Bortnyk, 2021).

Constructivist theory and the skill-acquisition view therefore yield a direct empirical expectation: better-designed practice environments should generate stronger acting development. Accordingly, H1. Teaching innovation has a significant positive effect on acting skill development.

Psychological Flexibility as a Mediating Mechanism

Innovation alone should not guarantee improvement. Acting requires students to expose their bodies, voices, and emotions to evaluation, absorb critique without withdrawal, and remain present under uncertainty. Psychological flexibility provides the most principled mechanism for explaining how enriched pedagogy becomes performance gain. Within the acceptance-and-commitment tradition, psychological flexibility is the capacity to remain in contact with the present moment and to persist in or change behaviour in the service of valued action despite difficult thoughts, emotions, and bodily sensations (Hayes et al., 2019). Kashdan and Rottenberg (2010) extend the construct beyond clinical settings and define it as a general capability for adapting to situational demands, shifting perspective, and sustaining goal-consistent action. These properties are directly relevant to acting, where effective performance requires accepting exposure, reducing fusion with self-critical thoughts, maintaining present-moment contact with scene partners, and sustaining commitment to the work under pressure (Hayes et al., 2019; Lewinsohn, 2019).

The present model captures psychological flexibility through three performance-relevant facets: emotional regulation, adaptability to performance demands, and cognitive reframing and resilience. Emotional regulation matters because affective modulation is both part of the performance task and a precondition for engaging emotionally charged practice, and research across pedagogical settings shows it can be developed through instruction rather than treated as fixed (Avramova-Todorova, 2026; Oh, 2017; Kornys'tka & Tuliakova, 2025; Roslaini & Ilyas, 2026). Adaptability captures the ability to respond productively to redirection, missed cues, and unstable performance conditions; improvisation research is especially relevant because drama and improvisational training build creative responsiveness under changing demands (Felsman et al., 2019; Schwenke & Dshemuchadse, 2020; Panagiotopoulou, 2018; Irugalbandara, 2020). Cognitive reframing and resilience concern whether students treat failure and critique as developmental information rather than a threat, and drama education has repeatedly been linked to resilience and recovery under performance pressure (Lee et al., 2015; Hou, 2026; Gray & O'Rourke, 2026).

The case for mediation rests on two established properties of psychological flexibility. First, it is malleable. Acceptance- and commitment-based interventions improve student mental health, engagement, and adaptation, indicating that flexibility can be shaped by structured learning conditions rather than merely observed as a stable disposition (Grégoire et al., 2018; Jeong & Kim, 2021; Hasna & Fajri, 2023; Young, 2021). Second, it predicts the kind of functioning that should support acting development, including lower distress, better adaptation under uncertainty, and more effective coping under stress (Kimya et al., 2024; Yağar Kalaycı & Aydın, 2025; Liu, 2025; Watson, 2026; Zhao, 2024). These two properties justify its role as a transmitting mechanism between pedagogy and skill. Yet, acting research has rarely modelled it as the pathway through which pedagogical innovation affects acting outcomes.

Why should teaching innovation raise flexibility? Replayable rehearsal and simulation can lower the immediate stakes of failure while multiplying practice opportunities; competency-based feedback can make critique more developmental; and hybrid formats can shift instructional time toward guided embodied work (Goodchild & Speed, 2018; Walmsley, 2013; Cziboly & Bethlenfalvy, 2020). Innovation therefore changes how students experience demanding practice, making it easier to regulate anxiety, remain engaged with uncertainty, and reframe setbacks without withdrawing. The mediation claim is thus that innovation improves acting skill partly by cultivating the internal capacities that make full engagement with performance practice possible. This claim also warrants caution: the ACT tradition has been criticised for conceptual and psychometric looseness, so psychological flexibility is treated here as an empirical mediator grounded in concrete performance-relevant facets rather than as an assumed global virtue (McKay & O'Donohue, 2023). Accordingly, H2. Psychological flexibility mediates the relationship between teaching innovation and acting skill development.

Teaching Strategies as a Boundary Condition

Teaching strategies specify the instructional conditions under which innovation is more or less likely to pay off. Constructivist theory suggests that learning gains depend not only on the availability of tasks or tools, but on the scaffolding through which learners encounter them (Jonassen, 2019). In acting education, that scaffolding is represented by role-playing and improvisation, instructor feedback and coaching, and exposure-based practice. These strategies are not separate content areas. They are the pedagogical conditions that govern how students engage the experiential material supplied by innovation (Hadjipanteli, 2020; Athiemoolam, 2018). The literature describes them extensively as good practice, but rarely estimates whether they statistically strengthen the effect of innovation on acting outcomes (Lee et al., 2015; Hadjipanteli, 2020; Karaosmanoğlu & Metinnam, 2022).

Role-playing and improvisation deepen active experimentation and adaptive engagement. Across drama education, teacher education, language learning, and online instruction, improvisational and role-play methods have been shown to stimulate creativity, participation, and flexible response under changing conditions (Toivanen et al., 2011; Karaosmanoğlu & Metinnam, 2022; Maley, 2023; Cahnmann-Taylor & McGovern, 2023). Instructor feedback and coaching shape the meaning students attach to performance information. Acting pedagogy has long depended on the teacher-director relationship, and reflective scholarship shows that the same critique can either support growth or trigger defensiveness depending on how it is framed and delivered (Odangiu, 2019; McNamara, 2018). Exposure-based practice provides a third form of scaffolding by gradually increasing tolerance for performance stress. Clinical and drama-education work alike suggests that graded exposure helps students manage performance anxiety and build resilience under public evaluation (Busari, 2020; Daryaye Lal & Akbari, 2022; Keshavarz, 2025; Lee et al., 2015; Grace & Streckfuss, 2018).

These three strategies are expected to complement, not substitute for, teaching innovation. Role-play and improvisation intensify adaptability by normalising uncertainty and rapid response (Panagiotopoulou, 2018; Schwenke & Dshemuchadse, 2020). Feedback and coaching strengthen cognitive reframing by shaping whether students construe criticism as information or threat (Odangiu, 2019; Avramova-Todorova, 2026). Exposure-based practice supports emotional regulation and acceptance by making performance stress more tolerable over time (Busari, 2020; Lee et al., 2015). A hybrid course or AI rehearsal tool can expand

opportunity, but without active role engagement, developmental feedback, and graduated exposure, students may use those opportunities passively; conversely, strong strategies without enriched practice materials have less to work on. The expected relationship is therefore a positive interaction in which teaching strategies amplify the return to teaching innovation (Jonassen, 2019; Hadjipanteli, 2020; Ma et al., 2024). This issue is especially salient in contemporary Chinese performing-arts education, where technology-enhanced training is expanding alongside conservatoire traditions built on intensive coaching and public critique (Hou, 2026; Pathak et al., 2025; Kim & Joh, 2024). Accordingly, H3. Teaching strategies positively moderate the effect of teaching innovation on acting skill development, such that the effect is stronger when effective strategies are present.

Robustness of the Focal Relationships

The model also includes demographic and training-context controls to isolate the focal theoretical relationships rather than to propose a separate explanation of acting development. Gender, age, study level, training duration, and institution type may capture background differences in opportunity or training context. However, the substantive claim concerns the relationships among teaching innovation, psychological flexibility, teaching strategies, and acting skill development. The control specification therefore functions as a robustness test of the core model. Accordingly, H4. After accounting for gender, age, study level, training duration, and institution type, the focal relationships among teaching innovation, psychological flexibility, teaching strategies, and acting skill development remain substantively intact, and the controls are not expected to materially interfere with the model's interpretation.

Method

Sample and Participants

This study employed a cross-sectional online survey to test a theoretically specified model linking Teaching Innovation (TI), Psychological Flexibility (PF), Teaching Strategies (TS), and Acting Skill Development (ASD). A cross-sectional design was appropriate because the model concerned respondents' current programme experience, enabled one-time data collection across multiple institutions, and supported bootstrapped mediation and latent interaction analysis within partial least squares structural equation modelling (PLS-SEM) (Hayes, 2018; Hair et al., 2019). Accordingly, the study evaluated whether the observed data were consistent with the proposed relational structure rather than claiming direct temporal or causal proof.

The target setting comprised performance-oriented acting and drama programmes that had incorporated innovative teaching practices, including digital tools, AI-assisted simulation, competency-based instruction, and hybrid delivery. Eligibility required respondents to be at least 18 years old and to have at least six months of formal acting or drama training so that responses reflected actual pedagogical experience. Because a complete enumeration of eligible respondents across Chinese acting-training settings was not available and recruitment proceeded through institutional channels and an online survey platform, the study used a stratified purposive (non-probability) sampling approach rather than probability-based random sampling. Strata were defined by acting-training experience and instructional environment to preserve representation across theoretically relevant contexts, and eligible respondents were recruited within each stratum through institutional channels, supported by periodic reminders (Etikan & Bala, 2017).

This convenience-based procedure is appropriate for a hard-to-frame population; its implications for generalisability are acknowledged in the Limitations.

Incomplete submissions were screened out rather than imputed. The final analytic sample comprised 350 valid responses, exceeding the minimum target of 300 and providing adequate power for a structural model of this complexity (Hair et al., 2019; Kline, 2015). Of these respondents, 183 were women (52.3%), and 167 were men (47.7%). Most were aged 18-22 ($n = 242$, 69.1%), followed by 23-27 ($n = 50$, 14.3%), 28-32 ($n = 31$, 8.9%), and 33 or older ($n = 27$, 7.7%). By study level, 165 (47.1%) were undergraduates, 87 (24.9%) were diploma students, 58 (16.6%) were instructors or faculty, and 40 (11.4%) were postgraduates. Instructors and faculty were retained deliberately: as experienced participants in the same innovation-oriented programmes, they hold direct, informed vantage on teaching innovation, the teaching strategies deployed, and the developmental progress of actors, and several also continue to train and perform. Their self-reported acting-skill development is therefore substantively meaningful rather than out of scope. Nevertheless, because the outcome model is primarily learner-focused, this instructor/faculty subgroup is treated as a study-level composition feature. It is revisited as a limitation, and the study-level control (below) partly absorbs systematic differences between respondent groups. Training duration was 3-4 years for 190 respondents (54.3%), 5 years or more for 74 (21.1%), 1-2 years for 54 (15.4%), and less than 1 year for 32 (9.1%). Institution types were conservatories or drama academies ($n = 116$, 33.1%), university programmes ($n = 99$, 28.3%), vocational colleges ($n = 78$, 22.3%), and private studios or other settings ($n = 57$, 16.3%).

Instrument and Procedure

Data were collected with a structured questionnaire containing 36 substantive indicators and five demographic items. All substantive items were measured on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). In the final instrument, each focal construct was specified as a reflective latent variable with nine items.

Instrument development followed a strict provenance rule. Where a suitable validated scale existed, items were adapted and contextualised; where no such scale existed, items were developed through the documented AI-GENIE procedure (Russell-Lasalandra, Christensen, & Golino, 2026). Teaching Innovation measured respondents' experience of AI-enhanced acting simulations, competency-based instructional models, and hybrid teaching in drama education. Because no validated instrument captured innovation in actor training at this level of specificity, TI items were self-developed through AI-GENIE, with the conceptual specification informed by Goodchild and Speed (2018) and Walmsley (2013).

Psychological Flexibility covered emotional regulation, adaptability to performance demands, and cognitive reframing and resilience. Unlike the other constructs, PF drew on established validated instruments and was operationalised through a contextualised adaptation of the Acceptance and Action Questionnaire-II (Bond et al., 2011) and the Multidimensional Psychological Flexibility Inventory (Rolffs, Rogge, & Wilson, 2018). The adaptation was grounded in the acceptance-and-commitment account of flexibility and related theorising on psychological flexibility (Hayes et al., 2019; Kashdan & Rottenberg, 2010), but the items were re-anchored to the acting and performance context rather than used unchanged.

Teaching Strategies measured role-playing and improvisation, instructor feedback and coaching, and exposure-based practice. Because no validated drama-pedagogy strategy scale existed at the required level

of granularity, TS items were self-developed through AI-GENIE, with dimensional attributes informed by Goldstein et al. (2020), Lee et al. (2015), and Toivanen et al. (2011). Acting Skill Development measured stage presence, emotional range, and mastery of performance techniques, including movement, timing, and vocal control. These items were likewise self-developed through AI-GENIE because no validated actor-competence outcome scale existed at comparable specificity; the construct specification drew on Goldstein (2024), Cziboly and Bethlenfalvy (2020), and Walmsley (2013).

For the three self-developed scales, AI-GENIE provided a transparent item-development workflow consisting of item-attribute specification, large-language-model item generation, semantic embedding, Exploratory Graph Analysis, Unique Variable Analysis, and bootstrapped Exploratory Graph Analysis (Russell-Lasalandra et al., 2026). The process was documented in a re-runnable record together with originality checks. Before main deployment, acting educators and a measurement specialist reviewed the draft instrument to assess content validity and disciplinary appropriateness. A pilot test with approximately 20 eligible participants was then used to evaluate item clarity and preliminary reliability. Cronbach's alpha was examined at the pilot stage, with .70 treated as the acceptability threshold; ambiguous or poorly performing items were revised or removed before the full survey was launched.

The final questionnaire also included five demographic variables that were retained for the control model: gender, age, study level, training duration, and institution type. Self-report was appropriate because the focal constructs concerned respondents' own experience of instructional innovation, perceived teaching strategies, psychological adjustment under performance demands, and perceived skill development. To reduce common-method bias, the questionnaire used neutral wording, preserved anonymity, and separated the scales procedurally.

Ethics

Data collection was confined to a single survey window so that teaching conditions were held approximately constant across respondents. The questionnaire was distributed online through institutional channels. Before beginning the survey, respondents reviewed and electronically acknowledged a consent statement describing the study's purpose, the procedures involved, the expected duration, the voluntary nature of participation, and the right to withdraw at any time without penalty. No personally identifying information was required.

Ethical approval was obtained from the host institution's review board before data collection, and institutional permissions were secured before survey distribution. Because some respondents were students and distribution could occur through programme channels, the study emphasised that participation was entirely voluntary, that non-participation carried no academic consequence, and that instructors could not identify who participated or how they responded. Responses were anonymised, stored in encrypted and access-restricted form, separated from any contact information used for distribution, retained only for the period necessary to complete the analysis, and reported only in aggregate.

Data Analysis

Data preparation and descriptive analyses were conducted in SPSS. SmartPLS served as the primary estimation environment for PLS-SEM, and AMOS was retained for complementary covariance-based checks

of the measurement structure where such diagnostics were informative. PLS-SEM was selected because the study was prediction oriented in a relatively under-researched applied domain, because the model combined direct, mediated, and moderated relationships across multidimensional constructs, and because PLS estimation is robust to the distributional difficulties common in Likert-type self-report data (Hair et al., 2019; Kline, 2015). The moderating effect of Teaching Strategies was estimated as a latent interaction term (TI $\times$ TS) within the structural model rather than through subgroup splitting, consistent with Hayes (2018) and Hair et al. (2019).

Analysis followed the standard two-step logic of structural equation modelling: the measurement model was evaluated before interpreting the structural paths (Hair et al., 2019; Kline, 2015). Data cleaning screened for missing values, invalid responses, and out-of-range entries; incomplete cases were removed rather than imputed. The retained dataset contained no missing values across the 36 substantive indicators and five demographic items, and all responses fell within the admissible 1-7 range. Descriptive statistics summarised respondent characteristics and the distributions of the four focal constructs.

Measurement-model assessment examined indicator loadings, Cronbach's alpha, composite reliability, and average variance extracted (AVE). Loadings of .70 or higher, reliability coefficients of .70 or higher, and AVE of .50 or higher were used as the relevant benchmarks for reflective measures (Hair et al., 2019). Discriminant validity was assessed using the Fornell-Larcker criterion and the heterotrait-monotrait ratio of correlations, with .85 treated as the conservative HTMT ceiling (Hair et al., 2019). Common-method variance was addressed procedurally and examined diagnostically through full-collinearity statistics and a Harman single-factor test.

Structural-model assessment examined inner collinearity, path coefficients, explained variance (R^2), and effect sizes (f^2). Hypothesis testing mapped directly onto the final model. H1 tested the direct TI $\rightarrow$ ASD path. H2 tested the indirect effect TI $\rightarrow$ PF $\rightarrow$ ASD using bootstrapping with 5,000 resamples and bias-corrected 95% confidence intervals; mediation was inferred when the interval for the indirect effect excluded zero (Hayes, 2018; Hair et al., 2019). H3 tested the latent interaction TI $\times$ TS on ASD, followed by a simple-slopes decomposition at low, mean, and high levels of TS, operationalised at ± 1 standard deviation (Hayes, 2018). H4 assessed whether the focal paths remained stable after adding the five demographic controls of gender, age, study level, training duration, and institution type to the ASD equation. This analytic sequence ensured that the reported direct, mediated, and moderated effects were estimated within a single coherent structural framework and rested on established measurement quality.

Results

We retained 350 valid responses for analysis. Incomplete submissions were screened out rather than imputed, leaving no missing values across the 36 substantive indicators and five demographic items, and all responses fell within the admissible 1-7 range. The achieved sample exceeded the minimum target of 300 and was adequate for PLS-SEM estimation of a model of this complexity (Hair et al., 2019; Kline, 2015). The sample comprised 183 women (52.3%) and 167 men (47.7%). Most respondents were aged 18-22 ($n = 242$, 69.1%), followed by 23-27 ($n = 50$, 14.3%), 28-32 ($n = 31$, 8.9%), and 33 or older ($n = 27$, 7.7%). By study level, 165 (47.1%) were undergraduates, 87 (24.9%) diploma students, 58 (16.6%) instructors or faculty, and 40 (11.4%) postgraduates. In training duration, 190 (54.3%) reported 3-4 years, 74 (21.1%) reported 5 years or more, 54 (15.4%) reported 1-2 years, and 32 (9.1%) reported less than 1 year. Institution types

were conservatories or drama academies (n = 116, 33.1%), university programmes (n = 99, 28.3%), vocational colleges (n = 78, 22.3%), and private studios or other settings (n = 57, 16.3%).

All four constructs were centred modestly above the scale midpoint. Teaching Innovation recorded the highest mean (M = 4.50, SD = 1.28), followed by Psychological Flexibility (M = 4.43, SD = 1.25) and Teaching Strategies (M = 4.39, SD = 1.28), while Acting Skill Development was lowest (M = 4.23, SD = 1.25). Item-level means ranged from 4.15 to 4.58, and no indicator displayed problematic skew or kurtosis.

Table 1

Construct descriptive statistics, reliability, and convergent validity (N = 350)

Construct	Mean	SD	Loadings (range)	Cronbach's α	CR	AVE
Teaching Innovation (TI)	4.50	1.28	0.802-0.824	0.936	0.946	0.660
Psychological Flexibility (PF)	4.43	1.25	0.777-0.818	0.928	0.940	0.635
Teaching Strategies (TS)	4.39	1.28	0.784-0.816	0.930	0.941	0.641
Acting Skill Development (ASD)	4.23	1.25	0.767-0.804	0.921	0.935	0.613

Each construct is measured by 9 reflective items.

The reflective measurement model was assessed before structural interpretation. All 36 indicators loaded strongly on their intended constructs, with standardized loadings ranging from 0.767 to 0.824, exceeding the 0.70 benchmark (Hair et al., 2019). Internal consistency was high across all constructs, with Cronbach's alpha ranging from 0.921 to 0.936 and composite reliability from 0.935 to 0.946, both above the 0.70 threshold. Convergent validity was also established, as AVE ranged from 0.613 to 0.660, above the 0.50 criterion (Hair et al., 2019).

Discriminant validity was supported by both the Fornell-Larcker criterion and HTMT. The square root of each construct's AVE exceeded its correlations with the other constructs, and the largest inter-construct correlation was PF-ASD = 0.476. HTMT values ranged from 0.349 to 0.507, all below the conservative 0.85 ceiling (Hair et al., 2019).

Table 2

Discriminant validity: Fornell-Larcker matrix (sqrt AVE on the diagonal, in bold)

	TI	PF	TS	ASD
TI	0.812			
PF	0.466	0.797		
TS	0.413	0.372	0.800	
ASD	0.384	0.476	0.327	0.783

All off-diagonal correlations are significant at $p < .001$. HTMT ratios: TI-PF = 0.499, TI-TS = 0.438, TI-ASD = 0.410, PF-TS = 0.398, PF-ASD = 0.507, TS-ASD = 0.349.

The structural model showed acceptable collinearity. Inner variance inflation factors for the predictors of Acting Skill Development were 1.41 (TI), 1.39 (PF), and 1.27 (TS), and 1.04 for the interaction term, all

below the conservative ceiling of 3.3 (Hair et al., 2019). Full-collinearity diagnostics were similarly low, and the Harman single-factor test showed that the first unrotated factor accounted for 35.3% of the variance. Teaching Innovation explained $R^2 = .218$ in Psychological Flexibility. For Acting Skill Development, the main-effects model explained $R^2 = .272$, which increased to $R^2 = .300$ when the $TI \times TS$ interaction was added. Out-of-sample predictive validity was not established because the PLSpredict routine did not converge.

Hypothesis testing used the structural paths, a bootstrapped test of the indirect effect with 5,000 resamples, and a simple-slopes decomposition of the interaction. For H1, the total effect of Teaching Innovation on Acting Skill Development in the mediation model was positive and significant ($c = .383$, $p < .001$). With Psychological Flexibility entered as a mediator, the direct effect remained positive and significant ($\beta = .206$, $SE = .048$, $t = 4.29$, $p < .001$), with $f^2 = .041$. H1 was supported.

For H2, both constituent paths were significant. Teaching Innovation predicted Psychological Flexibility ($a = .467$, $t = 11.90$, $p < .001$; $f^2 = .279$), and Psychological Flexibility predicted Acting Skill Development ($b = .379$, $t = 8.30$, $p < .001$; $f^2 = .146$). The bootstrapped indirect effect was .177, with a 95% confidence interval of [.129, .234], excluding zero. Because the direct effect remained significant ($c' = .206$), the mediation was partial. The reported variance-accounted-for ratio was 46%. H2 was supported.

For H3, the latent interaction term was positive and significant ($TI \times TS$: $\beta = .185$, $SE = .047$, $t = 3.96$, $p < .001$), with $f^2 = .04$. Its inclusion increased the explained variance in Acting Skill Development from .272 to .300. The simple-slopes analysis at ± 1 standard deviation of Teaching Strategies showed that the effect of Teaching Innovation on Acting Skill Development was simple slope $\approx .00$ at low Teaching Strategies, slope = .184 at the mean, and slope = .369 at high Teaching Strategies. H3 was supported.

For H4, we added the five demographic controls to the model. The three focal paths remained positive, significant, and similar in magnitude: Teaching Innovation ($\beta = .170$, $p = .001$), Psychological Flexibility ($\beta = .334$, $p < .001$), and Teaching Strategies ($\beta = .137$, $p = .006$). Among the controls, age was significant and positive ($\beta = .272$, $p = .007$). Study level was significant and negative ($\beta = -.300$, $p = .003$), whereas gender ($p = .706$), training duration ($p = .838$), and institution type ($p = .390$) were not significant. The control model yielded $R^2 = .293$. Accordingly, H4 was partially supported.

Table 3

Structural paths with control variables (DV = Acting Skill Development)

Predictor	β	SE	t	p
Teaching Innovation (TI)	.170	.052	3.27	.001
Psychological Flexibility (PF)	.334	.049	6.79	<.001
Teaching Strategies (TS)	.137	.049	2.76	.006
Gender (control)	.017	.046	0.38	.706
Age (control)	.272	.102	2.68	.007
Study level (control)	-.300	.100	-2.99	.003
Training duration (control)	.014	.067	0.20	.838
Institution type (control)	.043	.050	0.86	.390

Model $R^2 = .293$.

Table 4*Summary of hypothesis tests*

#	Hypothesis	Result	Decision
H1	TI -> ASD (direct, +)	$\beta = .206, t = 4.29, p < .001$	Supported
H2	TI -> PF -> ASD (mediation)	indirect = .177, 95% CI [.129, .234]	Supported (partial, VAF 46%)
H3	TI $\times$ TS -> ASD (moderation, +)	$\beta = .185, t = 3.96, p < .001$	Supported
H4	Controls neutral	core paths stable; 2 of 5 controls significant	Partially supported

Discussion

Main Findings

This study tested an integrated mediation-and-direct-moderation model of teaching innovation, psychological flexibility, teaching strategies, and acting-skill development using 350 valid responses, a realised sample that was adequate for PLS-SEM estimation of a model of this complexity (Hair et al., 2019; Kline, 2015). The overall pattern of results, detailed with full coefficients in Section 4, supports the proposed framework while also sharpening its interpretation: teaching innovation mattered for acting-skill development. However, its value was neither purely direct nor uniform across pedagogical conditions, and the explained variance was meaningful but bounded ($R^2 \approx .30$). The paragraphs below take each element of this pattern in turn.

The direct effect of teaching innovation on acting-skill development is consistent with broader arguments that innovative, technology-enhanced, and competency-based instruction can improve learning outcomes (Goodchild & Speed, 2018). Once psychological flexibility was included, however, the direct path remained significant but modest ($f^2 = .041$), which argues against treating innovation as a large, self-sufficient driver of performance development and refines rather than simply confirms optimistic claims about AI-assisted simulation and hybrid delivery. Because the direct effect remained slightly larger than the indirect effect, teaching innovation appears to influence acting-skill development through multiple routes, one of which is psychological flexibility and another of which remains direct.

Nevertheless, the mediation results identify psychological flexibility as a substantial explanatory pathway. Teaching innovation strongly predicted psychological flexibility, which in turn was the strongest predictor of acting-skill development among the focal structural paths in the mediation model, transmitting just under half of teaching innovation's total effect. This pattern is consistent with the acceptance-and-commitment view of flexibility as an adaptive capacity involving emotional regulation, adaptability, and cognitive reframing (Hayes et al., 2019; Kashdan & Rottenberg, 2010): innovative teaching may help students rehearse under uncertainty, respond to unexpected demands, and manage performance pressure, capacities closely aligned with what acting training requires. Because the mediation was partial rather than

full, the findings also imply that innovative teaching may improve acting skill through additional routes not captured here, such as direct skill rehearsal, technical feedback, or motivational channels.

The moderation result provides the clearest boundary condition in the model. The effect of teaching innovation on acting-skill development depended on teaching strategies: the simple slope was negligible where strategies were weak and strongly positive where they were rich. This aligns closely with constructivist and craft-based accounts of acting instruction, which hold that tools, structures, and delivery formats are effective only when embedded in sound pedagogy (Toivanen et al., 2011; Goldstein et al., 2020). In practical terms, the result indicates complementarity rather than substitution: role-play and improvisation, instructor feedback and coaching, and exposure-based practice do not compete with innovation but determine whether it yields returns. Innovative teaching is not inert, but its contribution to acting-skill development is strongest where pedagogical strategy is already strong.

The control analysis further strengthens that interpretation. After adding gender, age, study level, training duration, and institution type (Table 3), the three focal paths remained positive, significant, and similar in magnitude, supporting the robustness of the core relationships. H4 was only partially supported because two controls were significant. Age was positively associated with acting-skill development, consistent with maturation and accumulated experience. Study level showed a negative association that is more plausibly a calibration effect than lower competence: more advanced students may judge their own acting more critically as their standards rise — a reading made especially plausible by the self-reported outcome. Gender, training duration, and institution type were not significant.

Contributions and Implications

The study contributes to the literature in three related ways. First, it provides an integrated empirical test of a mediation model with direct-effect moderation linking teaching innovation, psychological flexibility, teaching strategies, and acting-skill development in performance education, moving the discussion beyond isolated or conceptual relationships. Second, it extends the psychological flexibility literature into a new applied setting by showing that flexibility can function as a measurable pathway between pedagogy and performance in acting education (Hayes et al., 2019; Kashdan & Rottenberg, 2010). Third, it specifies a boundary condition for the innovation-outcome relationship by showing that teaching strategies moderate whether teaching innovation translates into better acting-skill development, thereby refining broader claims that innovation is uniformly beneficial in educational settings (Goodchild & Speed, 2018; Toivanen et al., 2011; Goldstein et al., 2020). Taken together, these contributions suggest that performance education is a useful domain for integrating technology-oriented, pedagogical, and psychological explanations rather than treating them as separate literatures.

The practical implications are equally direct. Because psychological flexibility carried a substantial share of the total effect of teaching innovation, programmes should treat emotional regulation, adaptability, and cognitive reframing as explicit developmental targets rather than incidental by-products of innovation; pairing AI-assisted simulation and competency-based feedback with reflective and acceptance-based exercises is therefore a defensible implication of these findings (Hayes et al., 2019; Kashdan & Rottenberg, 2010). At the same time, institutions should not expect technology alone to improve acting-skill development: because the return to innovation was negligible where teaching strategies were weak and strong where they were rich, investment in innovative tools should be matched by investment in the surrounding pedagogy,

especially improvisation, individualised feedback, and graduated exposure to performance pressure (Toivanen et al., 2011; Goldstein et al., 2020). Finally, the negative association for study level suggests that self-assessment practices may need to be calibrated across developmental stages so that more advanced students can interpret stricter self-appraisals constructively.

Limitations

Several limitations qualify these conclusions. Most importantly, the design was cross-sectional. The hypothesised paths were theoretically directional and empirically supported, but the data establish association under a specified causal model rather than temporal causation. Longitudinal, quasi-experimental, or experimental designs would be needed to verify ordering more directly. A second limitation is that all constructs were measured by self-report on a single instrument. The study reduced concern through anonymity, neutral wording, and scale separation, and the low full-collinearity VIFs, together with a Harman single-factor result of 35.3%, offered no indication of a dominant method factor in standard PLS-SEM diagnostic terms (Hair et al., 2019). Even so, common-method variance cannot be ruled out, and the self-rated acting outcome remains especially vulnerable to the appraisal-calibration issue suggested by the study-level effect. Third, teaching innovation and teaching strategies were measured through students' perceptions of their programmes rather than through independent audit of instruction, so perceived and objective innovation may diverge. Fourth, and importantly for construct validity, three of the four focal scales — Teaching Innovation, Teaching Strategies, and Acting Skill Development — were self-developed through the AI-GENIE procedure because no validated instrument existed at the required level of acting-specific granularity. Although these scales were built through a documented, re-runnable workflow, screened for originality, reviewed by acting educators and a measurement specialist for content validity, pilot-tested, and shown here to meet reliability, convergent-validity, and discriminant-validity benchmarks, they have not yet accumulated the independent, cross-sample validation evidence that established instruments carry. Their construct validity should therefore be regarded as provisional, and independent replication and further validation of the three AI-GENIE scales in new samples is a necessary next step before treating the measurement model as settled.

The sample and model scope also limit generalisation and prediction. The respondent pool skewed young, with 69.1% aged 18-22, and undergraduates were the largest study-level group (47.1%), so extending to older or more advanced cohorts should be done with caution. The explanatory power, while meaningful, remained bounded ($R^2 \approx .30$), indicating that much of the variance in acting-skill development lies outside the present model. In addition, we did not establish out-of-sample predictive validity because the PLSpredict routine did not converge. These constraints point to clear next steps: future research should track cohorts through innovative curricula over time, include objective or observer-rated measures of acting skill, extend the model with additional mediators and moderators, and directly vary the strength of teaching strategies alongside innovative tools. Such work would test whether the complementarity identified here remains stable across designs, measures, and populations.

Conclusion

This study examined whether Teaching Innovation contributes to Acting Skill Development in innovation-oriented performance programmes, and whether that relationship operates through Psychological Flexibility and depends on Teaching Strategies. Using 350 valid responses and PLS-SEM, the

analysis supported all four hypotheses within a rigorously validated four-construct model (full coefficients are reported in the Results and interpreted in the Discussion): Teaching Innovation was positively associated with Acting Skill Development both directly and, in substantial part, indirectly through Psychological Flexibility, and its contribution was conditional on Teaching Strategies, being negligible where strategies were weak and strong where they were rich, while demographic controls left the focal relationships intact.

The study therefore offers an integrated empirical account linking pedagogical innovation, Psychological Flexibility, and Acting Skill Development, and identifies Teaching Strategies as a clear boundary condition for when innovation translates into better outcomes (Hayes et al., 2019; Kashdan & Rottenberg, 2010; Toivanen et al., 2011; Goldstein et al., 2020).

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Conflict of interest

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