

Chapter Four

The Combination of Simulation and Virtual Exchange as a Pedagogical Approach in Internationalisation at Home

Maria Laura Angelini

Universidad Católica de Valencia 'San Vicente Mártir,' Spain
marialaura.angelini@ucv.es

Rut Muñiz

Universidad Católica de Valencia 'San Vicente Mártir,' Spain
rut.muniz@ucv.es

Neus Álvarez

Universidad Católica de Valencia 'San Vicente Mártir,' Spain
mn.alvarez@ucv.es

Purpose This chapter addresses simulation in teacher education by drawing on some of the many publications that have suggested simulation as a pedagogical strategy. Its benefits include the development of professional competencies such as decision-making, critical thinking, dialogic learning, interpersonal competence, and communication. In this work, we review various applications of simulation in teacher education and give a brief overview of the classic simulation procedure. We consider that simulation can be used to develop the employability skills of both local and international students and that it can enhance their intercultural skills and awareness, which will empower them in their future careers.

Study design/methodology/approach The structure of the current chapter is composed of three sections. The first deals with current research on the subject. The second explains the simulation methodology and its phases, and finally, it reflects on the conclusions and implications of simulation in education.

Findings Literature alerts us to the lack of innovation in the preparation of future teachers and how simulation and other active methodologies are helping to open new doors in this area. It also shows how simulation can contribute to the training of globally minded teachers in combination with other methodologies, such as virtual exchange.

Originality/value The value of the current chapter is based on the proposal of simulation as a methodological strategy in the training of future teachers. Furthermore, the combination of simulation and virtual exchange is presented to provide added international value by creating virtual spaces for multicultural collaboration and internationalisation at home.

Introduction

In order to address the issue at hand and thus substantiate the need for a shift in approaches to teacher education, it is necessary to bring together some influential voices that have alerted us to parsimony in teacher education. As early as 2002, Hoban claimed that most teacher education courses represented a fragmented view of learning. He argued that teacher instruction had enormous potential to structure and prevent pre-service teachers from becoming resourceful practitioners. He referred to the difficulties pre-service teachers encountered in coping with life in the classroom. Other authors also noted that pre-service teachers were often unable to draw on essential knowledge when they needed it most (Kervin & Turbill, 2003; Stronge, 2002; Danielson, 1996; Entwistle et al., 1993). Now, two decades later, the situation has little changed. In an ideal environment, pre-service teachers should be provided with a range of opportunities to experience representative situations in real classroom settings that would forge a progressive development of their practice. However, there are still a number of obstacles to overcome, such as the cost of the Practicum experience, the needs of the school, the availability, and the requirements of university courses and guidelines set by the higher education institution.

However, it is fair to say that, despite little published research on teaching practice in schools, some efforts have been made to disseminate some initiatives on teacher education. Teacher preparation has shifted from lectures and discussions to individual analysis of group roles and individual and group decision-making. This shift builds on critical-dialogic pedagogies (Kohli et al., 2015), as pre-service teachers are exposed to theoretical scaffolding and real-world situations along with informational activities of various forms (Fraser et al., 2018). Active methodologies, such as case study, lesson study, or simulation, have gradually started to gain ground in teacher preparation, and interesting results are being collected. With regard to simulation in particular, some early research by Thompson and Dass (2000), for example, shows

that pre-service teachers who participated in classroom simulations performed better in terms of self-efficacy than those who only analysed and discussed isolated cases. Brozik and Zapalska (2002, 2003) and Sottile and Broznik (2004) used simulation in their teacher education as a result of their need to find a teaching approach that would replicate real classroom situations. The aim of their application of simulation was to explore decision-making techniques. They also discovered that through simulation, they provided an environment to work collectively with students and hone their communication skills. Probably the most salient discovery was that, through an unconventional learning environment, participants found the opportunity to develop their creativity and apply their knowledge to solve educational problems.

Ferry et al. (2004) designed a computer simulation in an attempt to help pre-service teachers learn how pupils acquire and develop literacy skills in primary school. A computer assisted the pre-service teachers as they had to make a number of decisions regarding the students, the classroom environment, and the events that took place there. At other times, they were asked to make decisions about a teaching sequence, such as how to introduce a lesson, transition activities, and pre- and post-teaching activities. Some of the most relevant results were that a significant number of pre-service teachers were able to make connections between their own school experiences and the situations presented in the simulation. Some were also able to relate the theory presented in their pre-teaching training to the educational challenges of the simulation scenario. With regard to virtual simulations, some popular computer programmes have gained ground in teacher education, such as SimTeacher and SimSchool. SimTeacher is an online teacher training simulation in which prospective teachers become SimTeachers in a virtual school. They have the opportunity to apply the concepts they are learning in their teaching careers to simulation scenarios. They are presented with virtual schools containing fictitious but interactive pupils. SimTeachers can perform daily tasks such as roll call or designing lesson plans. Similarly, SimSchool is a web-based virtual classroom environment with SimStudents who have artificial emotional intelligence. They react as if they were real humans, smiling, crying, getting frustrated, raising their hands, seeking attention, and showing signs of stress. SimSchool provides pre-service teachers with important classroom experience (Fischler, 2007).

Grossman (2009) points out that attention to pedagogy is central to teacher education and that neither the research literature nor the US education reform reports of the 1980s had much to say about how prospective teachers should be taught. The author undertook an extensive literature review on how prospective teachers were taught and how the various approaches used by trainers might impact students' know-how, including what they came to know or believe about teaching, and how they performed in practice in real or simulated classroom settings. He highlighted the potential of computer simulation in teacher education, which coincided with Fischler's findings. Later, Dotger (2011) claimed that simulation as a pedagogical strategy effectively helped bridge the gap between teacher preparation and practise. Teacher educators and researchers have thus paved the way for a more enlightened conception of simulation in teacher education.

Current Research

In less than a decade, between 2014–2021, several studies have been published extolling the virtues of simulation in teacher education. The general advantage is that more emphasis is placed on the active role of pre-service teachers, who can thus gain insights into the nature of the process being simulated (Bradley & Kendall, 2014; Gibson et al., 2014; Speed et al., 2015). Voices in favour of simulation in teacher preparation, such as Gibson et al. (2014) or Badiee and Kaufman (2015), argue that the conventional practicum commonly assigned to pre-service teachers to collect data on their teaching practice, does not always meet the expectations of trainers. An obvious question comes to mind: how can pre-service teachers acquire sufficient practice and knowledge of the full range of real classroom situations during their preparation? Teaching practice is the key to acquiring knowledge, and is at the heart of any teacher education programme. However, it depends to a large extent on the school mentors, the initiatives of the pre-service teachers, and the time devoted to dealing with different situations. More often than not, the practicum becomes a repository of experience more inclined to fulfil degree requirements than to reflect deeply on what actually happens in the real classroom (La Paro et al. 2018; Larsen & Searle, 2017; Sjølie & Østern, 2021).

However, some studies are increasingly questioning the gaps in the practicum. The incorporation of well-designed simulations to complement the practicum has come to the fore, according to Finn et

al. (2020), Gibson et al. (2014), Mukhtar et al. (2018), and Sasaki et al. (2020). Gibson et al. (2014), for example, urge schools of education to 'take simulation seriously in teacher education' (p. 2). In their handbook, the authors highlight the importance of developing a broad understanding of educational situations through the study of simulation scenarios and active participation in simulations. In this way, pre-service teachers can engage in a comprehensive, multi-step process. This would start with the investigation of the problems or cases presented in the scenario and end with the interaction between the participants in the simulation. So far, the adoption of simulation for teacher education seems to be based on the personal initiative of the teacher educator and not on an institutional model. This may be only the initial link in a chain of events. This, in turn, leads us to ask what is needed to make the use of simulation more durable, to make it evidence-based, and to engage others in a collective design process.

We can venture that teacher initiative alone is not enough. Heads of departments and deans of teacher education faculties should work together to ensure sufficient practice in a low-risk educational environment. This includes adopting active learning methodologies, such as simulation, to encourage real practice, supporting teacher research, and encouraging pre-service teachers to participate in forums, virtual exchanges, and national and international virtual mobilities, where educational issues are addressed. Most importantly, commitment must be obtained at the institutional level to ensure training and the continuity of trainers' initiatives to promote more active and realistic methods of teacher preparation. Gibson et al. (2014, p. 4) identify three main areas to boost simulation in schools of education: 'leadership, incentives, and support.' Schools of education must undergo a programme transformation by providing pre-service teachers with opportunities for real and simulated teaching practice. This transformation involves changes in beliefs about the potential of technologies, skilled action in recruiting and supporting talented innovators, and establishing an environment in which risk-taking and national and international collaboration lead to research, teaching, and dissemination. Incentives should include recognising and rewarding the initiatives of teacher educators to use their classrooms as laboratories to test methodological innovations in research.

Furthermore, it is crucial to foster the meeting of teachers and future teachers from different backgrounds in international forums such

as virtual exchanges, where cutting-edge strategies in education are discussed and commented upon, and to encourage new generations of teachers to take an intercultural approach to teaching in a global world.

As an example, we can talk about the integration of simulation and virtual exchange, which relies on the belief that today's teachers should think outside the box. In this sense, teachers should be acquainted with what other institutions are implementing, what type of training other teachers are getting, what challenges other schools are facing, and how they go about them. By working collaboratively with teacher trainers from abroad, teachers and students can find commonalities in some educational-related challenges (Angelini & Muñiz, 2023). Support has to do with providing the necessary framework for establishing and funding ongoing research, teaching, and the consolidation of proposal design teams.

Another aspect to be taken into account is the high level of stress generated by internships in real-world environments. McGarr (2021), revalidates simulation in dealing with this issue. For some pre-service teachers, their lack of experience in classroom management, for example, can be a real challenge. Simulation, however, can pave the way for real classroom practice. In this way, future teachers could experience aspects of disruptive student behaviour in less demanding environments, with less risk of getting it wrong. They could benefit from opportunities to make mistakes without fear of negative repercussions for their academic progression. Thus, the use of simulations is increasingly seen as an opportunity to experience examples of classroom life in an environment with low-risk concerns. Enquiry, dialogical learning among peers, teacher educators, and school mentors, and decision-making emerge as some of the most relevant and rewarding aspects of simulation in teacher preparation. Since our intention in this chapter is to present simulation as a complementary strategy in teacher education in particular, we will proceed to unfold the complex, but enriching, operational framework of simulation.

Simulation Methodology

In simulation-based training, simulation is divided into three main phases (Garcia-Carbonell et al., 2012; Kolbe et al., 2015); The briefing (Phase 1) consists of the preparation of the simulation. The trainer, henceforth the facilitator, must provide all the necessary information

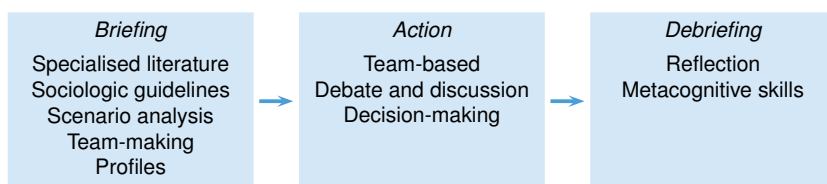


FIGURE 4.1 Simulation Classic Procedure

and rules that pave the way for the Action (Phase II). The briefing sessions are prior to the simulation action, where participants discuss issues related to the simulation scenario. It is important to stress the value of research in this phase. Participants should document and research the different issues or situations that will be dealt with in the scenario. They will be better prepared in terms of content and language to be able to dialogue and discuss during the simulation (Figure 4.1). The specific profiles can be strategically assigned to the participants after they have analysed the scenarios from the different perspectives of the profiles. In this phase, the general objectives of the simulation are presented. The facilitator forms the teams and then assigns the profiles to the individual team members.

The action (Phase II) is where the simulation takes place. All participants have objectives and responsibilities that are clearly specified in their profiles. The team leader can start the activity by thanking the members for their presence and addressing the problems that need to be solved. Debriefing (Phase III) takes place after the action. All participants (intra- or inter-group) reflect on the experience, their role, and their learning process. It is the phase of reflection, sharing, and evaluation at the individual and group level, in which participants analyse the different tasks and results of the previous phases. For a better understanding of the simulation, see the appendix with the simulation model, Global Village School. It is worth considering the advantages of using simulation in teacher training. Several authors have tried to identify the potential of simulations in the field of learning. According to García Carbonell et al. (2012), simulation does not dissect knowledge and communication skills, but rather fosters professional competence through a global cognitive process, which optimises results and justifies the full integration of simulation into curriculum design. Authors like McCrary and Mazur (2010) and Murphy and Cook (2020) have suggested that incorporating simulations into the classroom can promote

dialogic learning. Dialogue is central to classroom simulations. It leads to new understandings and new knowledge. This exploration through simulation, in which pre-service teachers construct meanings through dialogue, rather than having meanings imposed from outside, leads to powerful learning. Most importantly, learning through dialogue leads not only to content knowledge, but also to improved language, thinking skills, and intercultural awareness (Scarcella & Crookall, 1990; Burke & Mancuso, 2012; Michelson & Dupuy, 2014; Ranchhod et al., 2014). These studies agree that simulations provide more clearly structured interaction, more comprehensible input for learners, reduce the affective filter, and reduce learning anxiety.

Moreover, since the simulations are inspired by reality, pre-service teachers will have had the possibility to analyse and make decisions about some of the educational challenges described in the scenario before exposure to real-life situations. This contributes to the development of critical thinking skills. Starting from a logical organisation of information, future teachers are then encouraged to develop their creativity to find appropriate solutions to the problems presented in the scenario, to take responsibility for assuming a role, and, finally, to develop metacognitive skills to reflect on their own learning process (Daniel et al., 2005). Last but not least, another challenge of which facilitators should be aware of is the development of social skills. Simulations fit well with Vygotsky's social learning theory, according to which learners first engage in learning at the social or group level and then at the individual level. Pupils progress in stages, from what they can do by themselves, through what they can do with help, to what they cannot do. Future teachers find it difficult to progress through the zones of proximal development (ZPD) if social interaction and collaboration with other educators and peers is lacking (Vygotsky, 1978). During a simulation, pre-service teachers assimilate discipline-specific knowledge and develop social skills that they can transfer to professional settings (Havnes et al., 2016; Kourgiantakis et al., 2019).

Conclusion

This chapter focuses on simulation in teacher education. Simulation events provide a forum for applying prior knowledge and practical skills, developing a broader understanding of educational issues, and gaining new knowledge. Simulation should be conceived as a critical-dialogical pedagogy that seeks to construct knowledge through critical

reasoning, inquiry, and the search for answers. Furthermore, simulation, through its phases, facilitates opportunities to link knowledge and theory to application. This is why faculties of education are the ideal environment to initiate a true amalgamation of theory and practise as opposed to the rote reproduction of content. In addition, the combination of simulation and virtual exchange results in a pedagogical approach that contributes to internationalisation at home and the development of the skills needed in a multicultural professional context. Thus, finding common challenges in their professional careers and exchanging viewpoints on the most adequate measures to deal with them can be easily appreciated. The intercultural component can also be highlighted, especially in times of massive telematics information and communication. This intercultural perspective gains even more importance due to the growth of more multicultural classrooms. It seems imperative that teachers, pre-service teachers, and academics work on developing a global mindset to approach this reality.

References

- Angelini, M. L., & Muñiz, R. (2023) The wider perspective on simulation and virtual exchange in teacher training: Developing a holistic view of practitioner development. In M. L. Angelini & R. Muñiz (Eds.), *Simulation for Participatory Education: Virtual Exchange and Worldwide Collaboration* (pp. 361–368). Springer
- Badiee, F., & Kaufman, D. (2015). Design evaluation of a simulation for teacher education. *Sage Open*, 5(2), 2158244015592454.
- Bradley, E. G., & Kendall, B. (2014). A review of computer simulations in teacher education. *Journal of Educational Technology Systems*, 43(1), 3–12.
- Brozik, D., & Zapalska, A. (2002). The portfolio game. *Simulation and Gaming*, 33(2), 243–256.
- Brozik, D., & Zapalska, A. (2003). Experimental game: Auction! *Academy of Educational Leadership Journal*, 7(2), 93–103.
- Burke, H., & Mancuso, L. (2012). Social cognitive theory, metacognition, and simulation learning in nursing education. *The Journal of Nursing Education*, 51(10), 543–548.
- Daniel, M. F., Lafortune, L., Pallascio, R., Splitter, L., Slade, C., & De La Garza, T. (2005). Modeling the development process of dialogical critical thinking in pupils aged 10 to 12 years. *Communication Education*, 54(4), 334–354.
- Danielson, C. (1996). *Enhancing professional practice: A framework for*

- teaching*. Association for Supervision and Curriculum Development.
- Dotger, B. H. (2011). From know how to do now: Instructional applications of simulated interactions within teacher education. *Teacher Education and Practice*, 24(2), 132–148.
- Entwhistle, N., Entwhistle, A., & Tait, H. (1993). Academic understanding and the contexts to enhance it: A perspective from research on student learning. In T. M. Duffy, J. Lowyck, & D. H. Jonassen (Eds.), *Design environments for constructive learning* (pp. 331–357). Springer.
- Ferry, B., Kervin, L., Cambourne, B., Turbill, J., Puglisi, S., Jonassen, D., & Hedberg, J. (2004). Online classroom simulation: The next wave for pre-service teacher education. In *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference* (pp. 294–302). Australian Society for Computers in Learning in Tertiary Education.
- Finn, M., Phillipson, S., & Goff, W. (2020). Reflecting on diversity through a simulated practicum classroom: A case of international students. *Journal of International Students*, 10(S 2), 71–85.
- Fischler, R. (2007). SimTeacher.com: An online simulation tool for teacher education. *TechTrends*, 51(1), 44–46.
- Fraser, K. L., Meguerdichian, M. J., Haws, J. T., Grant, V. J., Bajaj, K., & Cheng, A. (2018). Cognitive load theory for debriefing simulations. *Advances in Simulation*, 3(1), 1–8.
- García Carbonell, A., Watts Hooge, F. I., & Andreu Andrés, M. A. (2012). Simulación telemática como experiencia de aprendizaje de la lengua inglesa. *REDU: Revista de docencia universitaria*, 10(3), 301–323.
- Gibson, D. C., Knezek, G., Redmond, P., & Bradley, E. (2014). *Handbook of games and simulations in teacher education*. Association for the Advancement of Computing in Education.
- Grossman, P. (2009). Research on pedagogical approaches in teacher education. In *Studying teacher education* (pp. 437–488). Routledge.
- Havnes, A., Christiansen, B., Bjørk, I. T., & Hessevaagbakke, E. (2016). Peer learning in higher education: Patterns of talk and interaction in skills centre simulation. *Learning, Culture and Social Interaction*, 8, 75–87.
- Hoban, G. F., (2002). *Teacher learning for educational change*. Open University Press.
- Kervin, L., & Turbill, J. (2003). Teaching as a craft: Making links between pre-service training and classroom practice. *English Teaching: Practice and Critique*, 2(3), 22–34.
- Kohli, R., Picower, B., Martinez, A. N., & Ortiz, N. (2015). Critical professional development: Centering the social justice needs of teachers. *The International Journal of Critical Pedagogy*, 6(2), 7–24.
- Kolbe, M., Grande, B., & Spahn, D. R. (2015). Briefing and debriefing dur-

- ing simulation-based training and beyond: Content, structure, attitude and setting. *Best Practice & Research Clinical Anaesthesiology*, 29(1), 87–96.
- Kourgiantakis, T., Bogo, M., & Sewell, K. M. (2019). Practice Fridays: Using simulation to develop holistic competence. *Journal of Social Work Education*, 55(3), 551–564.
- La Paro, K. M., Van Schagen, A., King, E., & Lippard, C. (2018). A systems perspective on practicum experiences in early childhood teacher education: Focus on interprofessional relationships. *Early Childhood Education Journal*, 46(4), 365–375.
- Larsen, M. A., & Searle, M. J. (2017). International service learning and critical global citizenship: A cross-case study of a Canadian teacher education alternative practicum. *Teaching and teacher education*, 63, 196–205.
- McCrary, N. E., & Mazur, J. M. (2010). Conceptualizing a narrative simulation to promote dialogic reflection: Using a multiple outcome design to engage teacher mentors. *Educational Technology Research and Development*, 58(3), 325–342.
- McGarr, O. (2021). The use of virtual simulations in teacher education to develop pre-service teachers' behaviour and classroom management skills: Implications for reflective practice. *Journal of Education for Teaching*, 47(2), 274–286.
- Michelson, K., & Dupuy, B. (2014). Multi-storied lives: Global simulation as an approach to developing multiliteracies in an intermediate French course. *L2 Journal*, 6(1), 21–49.
- Mukhtar, M. A., Hasim, Z., & Yunus, M. M. (2018). The efficacy of simulated teaching in preparing pre-service teachers for practicum. *Journal of Nusantara Studies*, 3(1), 64–74.
- Murphy, K. M., & Cook, A. L. (2020). Mixed reality simulations: A next generation digital tool to support social-emotional learning. In M. T. Grassetti & J. Zoino-Jeannetti (Eds.), *Next generation digital tools and applications for teaching and learning enhancement* (pp. 1–15). IGI Global.
- Ranchhod, A., Guru, C., Loukis, E., & Trivedi, R. (2014). Evaluating the educational effectiveness of simulation games: A value generation model. *Information Sciences*, 264(1), 75–90.
- Sasaki, R., Goff, W., Dowsett, A., Paroissien, D., Matthies, J., Di Iorio, C., Montey, S., Rowe, S., & Puddy, G. (2020). The practicum experience during Covid-19-supporting pre-service teachers practicum experience through a simulated classroom. *Journal of Technology and Teacher Education*, 28(2), 329–339.

- Scarcella, R., & Crookall, D. (1990). Simulation/gaming and language acquisition. In D. Crookall & R. Oxford (Eds.), *Simulation, gaming, and language learning* (pp. 223–230). Harper & Row.
- Sjølie, E., & Østern, A. L. (2021). Student teachers' criticism of teacher education: Through the lens of practice architectures. *Pedagogy, Culture & Society*, 29(2), 263–280.
- Sottile, J. M., & Brozik, D. (2004, 3–6 January). *The use of simulations in a teacher education program: The impact on student development* [Conference presentation]. Hawaii International Conference on Education, Honolulu.
- Speed, S. A., Bradley, E., & Garland, K. V. (2015). Teaching adult learner characteristics and facilitation strategies through simulation-based practice. *Journal of Educational Technology Systems*, 44(2), 203–229.
- Stronge, J. H. (2002). *Qualities of effective teachers*. Association for Supervision and Curriculum Development.
- Thompson, G. H. & Dass, P. (2000). Improving students' self-efficacy in strategic management: The relative impact of cases and simulations. *Simulation & Gaming*, 31(1), 22–41.
- Vygotsky, L. (1978). *Mind in society*. Harvard University Press.