Chapter 37
Students of Religion Studying Social Conflict Through Simulation and Modelling: An Exploration

Amrit Bahadur Poudel, Pauline Vos, and F. LeRon Shults

Abstract Researchers at our university use modelling and simulation (M&S) to study religious conflicts, and we wanted to introduce undergraduate students of religion to this research approach. Hence, we started a three-year educational design research project to empirically study ways to introduce these students to M&S as a viable research method in their discipline. The research project will entail several iterations, which aim to have a feasible and effective design of lessons and a better understanding of the learning processes. The first iteration was exploratory and is reported here. For this exploration, we organised a seminar, which was videotaped for post hoc analysis. The seminar started with an introduction of research methods to study violent human behaviour, comparing experiments in which people are exposed to violence in real and virtual worlds. Afterwards, the students explored an agent-based simulation based on Schelling's segregation model. The seminar was concluded as a plenary discussion. After the seminar, follow-up interviews were held with three students. The results suggest that this brief intervention enabled students to gain a good understanding of the way in which M&S can be used to study social conflicts and opened them up to the possibility of adopting the method in their future research. We also found that for an initial understanding of the use of M&S in social research, no knowledge of computational methods is required.

Keywords Students of religion · Research methods · Social conflicts · Social simulations

37.1 Introduction

Research in the social sciences has traditionally been limited to methods such as literature reviews, interviews, observations and surveys. These are also the research methods typically taught to students at universities. However, at our university, we

A. B. Poudel (✉) · P. Vos · F. LeRon Shults
University of Agder, Kristiansand, Norway
e-mail: amrit.poudel@uia.no; pauline.vos@uia.no; leron.shults@uia.no

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have a growing group of researchers studying social phenomena through modelling and simulation (M&S) [1]. It would be beneficial for students to also learn about M&S and not have their courses trail behind innovations. Thus, at our university, we wondered how to introduce students of religion to ways of studying religious conflicts using M&S. We started a three-year educational design research project to study emerging educational approaches that help students reason about how to study violent behaviour in artificial societies (without harming real people). How can we as research practitioners introduce students of religion to new M&S research methods and to inspire some to use these methods in their future research?

Educational design research is a research methodology for designing learning environments in cases where one needs new teaching methods to deal with new content [2, 3]. It enables a scholarly exploration for creating new learning environments, in particular in the area of educational innovation. The intent of the research is to produce design principles of feasible teaching practices and increased understanding on both of those practices and of students' learning. The approach is to start small, evaluate and then iteratively increase the scale of the educational intervention. Each iteration consists of a plan of a sequence of learning activities, which are enacted and formally evaluated. This leads to new reflections, conjectures and improvements of the design. In this chapter, we will present the first iteration of our study.

We hypothesised that an accessible entry into M&S research methods for students of religion would not be through the learning of coding and a crash course on the creation of M&S [4]. Instead, students of religion could better think of M&S as virtual worlds of social phenomena, which can imitate or reproduce real-world processes. We hypothesised that they could imagine that virtual worlds can support social researchers to run social experiments or to see what future scenarios could occur. We selected a digital simulation based on authentic research of human behaviour (described below) to serve as an example of M&S research. We planned it to potentially engage students in critical thinking, imagining alternative actions and problem-solving skills.

In our research on learning, we perceive students not only as actors in a learning context (as learners and as peers within a university course), as members of the university community, but also as social beings with extra-institutional experiences in the society. Within the narrow learning context, we use probing questions and a simulation to mediate student thinking, participation and communication. We perceive M&S as cultural tools that carry knowledge about social phenomena and hence capable of incorporating a social history into any learning activity in which religion students engage. We study their learning not simply as an interplay between minds and simulations; rather, we frame students learning in light of three sociocultural contexts: (1) the course, (2) the world of academic researchers using M&S in social research and (3) wider society in which there is a need to understand and limit conflicts. This theoretical frame of learning is inspired by Engeström's Cultural–Historical Activity Theory (CHAT) [5], which was developed to analyse the relationship between what people think, what they do, how they use tools and how different contexts interact in this. Our questions were: What are the strong and

weak points in our educational design? To what extent can the students understand how others (social researchers at their university) use M&S in their research? Would they using this approach in their future research?

37.2 Materials and Participants

In this first exploration of our design-based study, we created a learning context that consisted of a three-hour seminar that students could attend on a voluntary basis. It was an 'extra' within the compulsory bachelor's course 'Religious radicalisation, extremism and violence' taught by a group of lecturers from the department. The seminar was conducted by the second author. All students had been asked to bring a laptop. Those who hadn't brought one were paired to a peer with one. All activities in this seminar were filmed by the first author. All three authors participated in data analysis.

The seminar consisted of three sections. The first section was a lecture, in which different research methods in the social sciences were reviewed. This was followed by a discussion of the problem of carrying out live laboratory experiments with people. We presented the Zimbardo prison experiment carried out at Stanford University, designed to investigate whether random volunteers had dispositions associated with abusive behaviour [6]. This prison *simulation* has become famous, because it had to be stopped due to the excessive abuse that arose. It serves as an example of how live experiments can have serious ethical issues. Alternatively, in artificial societies, where individuals are not actual people but virtual entities, we can experiment with scenarios in ways that would be unethical in real societies with real people (Fig. 37.1).

In the second part of the seminar, we gave students hands-on experience with a simulation. For this, we selected a simulation that was freely available online, had a limited number of parameters (sliders) and connected to a theme that

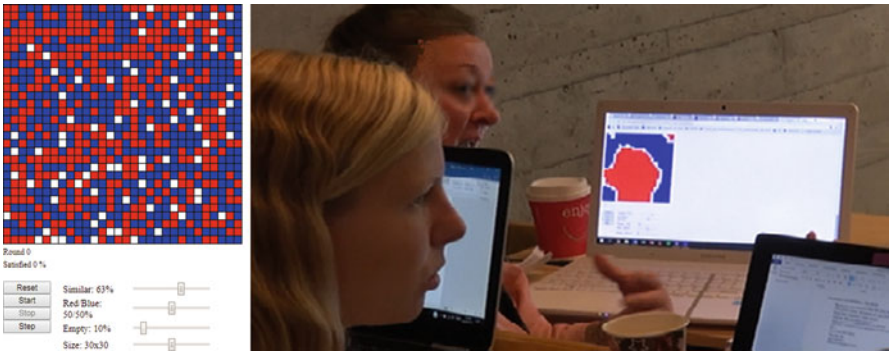

Fig. 37.1 Simulation based on Schelling's model of segregation (left) and classroom scene (right)

was likely to be of interest of the students: the social inclusion and exclusion of people. The simulation was based on a model of segregation created by American economist Thomas Schelling (http://nifty.stanford.edu/2014/mccown-schelling-model-segregation/). This simulation engages a user in understanding the processes of the segregation of two recognisable groups. The bottom line of this model is that segregation can emerge even in relatively tolerant populations. It shows connections between micro-motives and macro-behaviour and reveals *hidden causal architectures* in social systems. The third part of the seminar consisted of a discussion guided by probing questions such as: Why do researchers use M&S? What questions could be answered by creating a virtual Norway? What are limitations of M&S? Are you interested in doing research using M&S?

In the weeks after the seminar, the first author conducted follow-up interviews with three students, who volunteered to be interviewed. They were asked to evaluate the seminar and describe what they recalled from it.

The video recordings of participants' interaction in the seminar (with the simulation and with each other) and the videos of the follow-up interviews were analysed in light of the CHAT framework with the goal of answering the research questions.

37.3 Results

Interaction of the students during the seminar Students fully engaged in the hands-on activity and discovered how small individual bias can lead to large collective segregation. They interacted with the simulation by using the sliders and click buttons. We observed wonder, excitement and sorrow on their faces. They played with the parameters to explore future scenarios, and without exception, they tried to create positive, unsegregated outcomes. This shows that within a short time, the simulation had become a tool, which students manipulated to reach a certain goal, and that it appealed to their social feelings. Thus, the simulation created a connection between the students, their goals and social life beyond the university.

In the third part of the session, the teacher posed probing questions. To the question on what could be studied using M&S, students came up with several examples. It could be applied to forecasting elections, to predicting unemployment rates, 'to understand criminality by understanding people's behaviour' or to discover 'what would happen if radical religious groups came into power'. These varied answers indicate that the students were able to connect M&S to doing social research. Additionally, two students expressed interest in using M&S in future research.

Follow-up interview with students In the follow-up interview, one student said: 'It is easy to find answers to hypothetical questions in social research using social simulation..... we may not be able to afford experiments like Zimbardo, which has a high cost value as well it as affects peoples' personal lives. Instead, if you run

computer simulations, it is less harmful and more cost effective.' Another student reflected: 'It made me easier to understand when LeRon talked about computer simulations later on in the course.' These answers indicate that the students were able to connect the simulations to researchers who use M&S. Moreover, when a student uses the pronoun 'we', this suggests he considers himself a potential researcher.

37.4 Conclusions, Discussion and Recommendations

We observed that the students of religion showed an understanding of the opportunities M&S offer to understand hidden architectures of social phenomena. They were very aware that live experiments with people have disadvantages, and they could imagine questions that only M&S can answer. During the seminar, there was increased understanding that M&S can be a tool in research on religious conflicts. Some students showed a keen interest in M&S for their future research. We conclude that the M&S approach to studying social phenomena offers a pedagogical innovation for dealing with topics such as religious radicalisation, extremism and violence. Of course, it remains speculative whether this first encounter with M&S will motivate them to take up a course in programming. We will further explore this in the next iterations of our research.

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