PART THREE

LEARNING DESIGN AND IMPLEMENTATION
An assessment of emerging technologies carried out in the *Horizon Report* (New Media Consortium and EDUCAUSE Learning Initiative, 2007) identified massively multi-user virtual environments (MUVEs) as one of the major technological platforms that would impact the innovation and enhancement of the student learning experience. This expectancy was framed by a description of the almost limitless possibilities for cooperation and content creation afforded by MUVEs. These were virtual spaces where teachers and learners, embodied as avatars, could engage in extended and safe social interaction in a 3D world lacking a pre-set structure and narrative.

These spaces offer opportunities for education that are almost limitless, bound only by our ability to imagine and create them. Campuses, businesses, and other organizations increasingly have a presence in the virtual world, and the trend is likely to take off in a way that will echo the rise of the Web in the mid-1990s. (New Media Consortium and EDUCAUSE Learning Initiative, 2007, p. 18)

At that point MUVEs rapidly gained interest and credibility among a range of forward-thinking educators looking for new opportunities to extend their modes of teaching. These compelling virtual spaces offered a sense of freedom, otherness,
and re-embodiment that could take the learner outside of themselves and into a life not simply on the screen but inside it (Schroeder, 1996, 2008; Turkle, 1995). What has continued to attract educators to MUVEs such as Second Life (SL) is the particular range of possibilities for enhancing learning that are not found consistently in other learning and teaching platforms, including:

- Flexible engineering of learning spaces;
- User-content/object creation and ownership;
- Extended social and human–machine interactions: person-to-person, person-to-object, and between objects;
- The potential to develop classrooms and community-based scenarios that mirror or extend those that exist in the real world;
- Implementation of non-traditional learning approaches and methodologies such as socio-constructivism and situated learning, experiential learning, project-based learning, game-based learning, simulations, and role play;
- The potential to use them as tools to engage learners, foster motivation, and facilitate self-organization of learning.

MUVEs have therefore been represented as an appealing, technology-enhanced learning space for educators to exploit. However, the expected impact of virtual worlds on mainstream education, or indeed distance education, has not yet taken place. There are a number of reasons that are often cited to explain the difficulties that educators have experienced in passing the tipping point. These include the high training threshold for end-users, limitations on scalability, hardware costs, and lack of interoperability (Warburton, 2009; Smith-Robbins, 2011). But between the lines of these experiences, we can also read the difficulty that educators have found in negotiating the tension between building the required pedagogical practice for teaching online, and developing the necessary expertise in technology, both of which are required in order to make effective use of a virtual world like Second Life. As Martinez, Martinez, and Warkentin comment, “although the teacher has more than 15 years of experience in academia, he found problems while designing lecture and during the delivery due to the relatively unknown media capabilities” (2007, p. 52).

Because virtual world classrooms often resemble, and indeed try to mirror, their real-life counterparts, there has followed an assumption that “if one is a teacher in the real world then one can, by extension, teach in this different yet recognizable virtual space.” The emerging literature on the use of virtual worlds for education provides some evidence to the contrary and seems to indicate that
experienced real-life (RL) educators struggle to make their virtual teaching practice as effective as their RL teaching practice, or even to integrate Second Life successfully into their teaching repertoire. The freedom of the environment, the lack of technological skills, and a poor understanding of socio-cultural codes are some of the reasons that have led many educators to overcompensate by trying to recreate traditional learning scaffolds and replicate RL teaching practices, with variable degrees of success (Carr, Oliver, & Burn, 2010). This has highlighted one of the key problems about working with cutting-edge tools: there is often a paucity of material, such as guides and good practices, to help steer those who are enthusiastic but unsure of how to proceed. That said, the body of material is increasing and there are guidelines that have been published describing principles of virtual world teaching in a variety of areas, such as in cooperative and collaborative learning (Robertson & Kipar, 2010; Warburton & Pérez García, 2009), but there is a gap in concrete design guides or inventories to help educators practically instantiate their inworld teaching sessions.

Despite these questions about the transferability of RL teaching practices into MUVEs, it was clear that an experienced observer of teaching activity inside Second Life could find pockets of successful practice. While many formal education bodies were struggling with their virtual spaces, there were a host of non-professional educators who did appear to be teaching successfully within more informal learning settings and who possessed a high level of specific technical skills to help design their educational experiences. Preliminary field observations were revealing, indicating that teaching expertise was not the only factor that impacted positively on the planning and delivery of instruction in virtual worlds. A combination of other factors were playing an important role and provided a potentially rich source of good practices that could be studied and collected to pass onto others.

In order to explore the question of the transferability of RL teaching practices into MUVEs, and contrast the impact of pedagogical expertise against other factors such as the control of the technological environment, we conducted field research in Second Life between October 2007 and July 2009 and focused on the study of hands-on workshops.

**Hands-On Workshops Inside Second Life**

There are a variety of teaching practices taking place inside virtual worlds at any one time. These range from formal to informal interventions, with one of the most popular being hands-on workshops. These can be defined as synchronous
teaching events that generally aim to develop a participant’s practical skills, such as technical skills in building and/or scripting. In this study the workshops were non-formal, of short duration (on average, about one hour), and targeted small groups—the number of participants usually fluctuated between five and twenty. For the most part, these kinds of workshops are organized by non-formal learning providers in commercial or not-for-profit modes, who target the Second Life community at large with these opportunities to learn new skills and will cater to participants with differing levels of expertise.¹ The primary mode of instruction is usually text-based communication—a response to the often technical nature of the content being delivered and the requirement to be able to access and review the instructions after these are given by the facilitator. Some workshops did incorporate the use of voice with text, with a minority that made use of voice communication alone. The facilitators of these workshops are often experts in building and scripting who have been recruited as distance learning educators. While professional educators can and do organize workshops inside Second Life, most of these facilitators are non-professionals who have followed a few weeks of specific tutor training. By being publicly advertised as inworld educational events, we found the workshops were easy to access. Second Life citizens could use the search function to locate ongoing and upcoming educational events, though at the time of this research the list of workshops could only be sorted by keyword, maturity rating, and length through the search tool. There were no advanced search functionalities that would allow ordering by subject, tutor, learning provider, skill level, or language. With several workshops being offered each hour of the day, they represented one of the principal resources for learning Second Life-related skills inworld.²

In summary, the short duration of these teaching events, their popularity, and the ease of access made them an ideal object of study for observing and understanding the relationship between pedagogical expertise and technological knowledge in virtual worlds, and approaching the critical factors of effective design and delivery of instruction.

¹ That is, educational organizations that deploy their teaching activities exclusively inside Second Life—for example, activity was recorded from TuI, Rocklife University, NCI Classes, FSBU, Fermi Sandbox and University, SL Learning Centre, and Insight Virtual College.

² Other possibilities for those inworld included following self-paced tutorials, learning by informally watching others in public sandboxes, peer learning among friends, or being guided by a mentor, just to cite a few. External resources included public forums, dedicated Second Life wikis, and watching video tutorials on YouTube.
Objectives of the Research

The overall aim of this study was to identify the critical factors that impact positively on the design and delivery of workshops in virtual worlds. Our initial observations during preparatory fieldwork suggested that the control of the [virtual] physical environment where workshops took place played a fundamental role in their success. With the control of the environment being proportional to the technical skills of the workshop facilitator, we investigated how the technical skill levels of the facilitators impacted their pedagogical practice. The first step in this process was to objectively examine the workshops to better understand their composition. For this reason a threefold objective guided the research activities:

1. to identify the commonalities and differences of workshops in order to map patterns and existing declinations;
2. to develop an analytical device for planning, implementing, and evaluating hands-on workshops; and
3. to identify the factors that impact positively on their success.3

In addition, we expected that the results would lead to the identification of the kinds of knowledge needed by experienced RL educators to effectively design and implement workshops inside Second Life. The work presented here introduces the analytical device that we developed for planning, implementing, and evaluating workshops, and the results of the analysis show which factors played the greatest role in the effective delivery of workshops inside the virtual world, Second Life.

Our research focused exclusively on the analysis of workshops delivered through text-based interactions that were aimed at developing technical skills in building or scripting objects inworld, with each lasting a minimum duration of one hour.

Two distinct types of workshop activity were explored:

1. Analysis of 125 workshops organized by non-formal learning providers, and facilitated by people with strong technological content knowledge (about building and scripting 3D objects in virtual worlds) and technological knowledge (about the use of Second Life in general, and for facilitating a workshop). We, the authors, directly evaluated 25 of

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3 Impact assessment is based on the contextual evaluation of the effectiveness of teaching in relation to the knowledge, skills, and satisfaction gained by learners.
these workshops, which took place over a three-month period. The remaining 100 were evaluated from January to July 2009 by participants in the MUVEnation program using the analysis grid we developed.4

2. We designed and delivered two workshops, and a further 50 workshops that were organized during the MUVEnation program, facilitated by experienced educators with recently developed technological content knowledge about building and scripting 3D objects in virtual worlds. When they created their own workshops they were still developing their skills in using Second Life for educational purposes employing a learning-by-designing approach (Mishra & Koehler, 2003).

Methodology
The study was carried out in three distinct phases, and gathered qualitative data from multiple inquiry sources that were subsequently analyzed using a mixture of a grounded theory approach (Glaser & Strauss, 1967), thematic (Hayes, 2000), and narrative analysis (Kohler Riessman, 2008):

1. Participant observation was used to collect data during the analysis of the first 25 workshops inworld. The research involved a range of methods: direct observation, participation as learners in the workshops, collective discussions with other participants post workshop, informal interviews with the facilitators, and analysis of commentaries within secondary literature sources. The study of these workshops led to the design of a preliminary or “proto-analysis” grid ready to be validated as an evaluation tool for inworld instructional sessions presented in a workshop format.

2. The proto-analysis grid was distributed to members of the MUVEnation program who then, guided by the grid, used participant observation to collect the data from a further 100 inworld workshops. Their research involved a range of methods: direct observation, participation as learners in the workshops, synchronous collective discussions with

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4 MUVEnation was a European project co-funded by the European Commission under the 2007 Lifelong Learning program, Comenius–School education sub-program. The project developed a European peer-learning program for teacher training in the use of “Active learning with multi-user virtual environments to increase pupils’ motivation and participation in education.” The nine-month program attracted 107 participants from 26 countries worldwide (Pérez García, 2009).
other participants in the workshops, and asynchronous discussions within four online forums dedicated to the main themes identified in the analysis: (a) the planning and preparation of the instruction, (b) the delivery of the instruction, (c) the follow-up and evaluation, and (d) the activities for recalling and transferring learning. In total, the analysis of the 100 workshops evaluated by MUVEnation participants included

- Transcripts of online discussions about workshops between the authors and the participants in the MUVEnation program.
- Notes from observation and participation in the workshops made by MUVEnation participants in the program’s forum and wiki, and also in their individual blogs.
- Transcripts of synchronous discussions within Second Life or Skype about workshops with the participants in the MUVEnation program.

3. With the aim of testing the grid beyond the sole purpose of its use as an evaluation tool, we prepared two workshops, taking into account the identified themes as a rubric for their design and implementation. We analyzed these by completing case-stories in the form of personal narratives and collective discussions with the participants of the workshops. This resulted in

- Two case-stories in the form of personal narratives retelling and reflecting of the design experience.
- Non-structured feedback from participants in the workshops.

Following this initial effort, 50 participants of the MUVEnation program were then encouraged to design and implement their own workshops in a similar manner. Post-workshop analysis was then carried out on the case-stories written in the form of personal narratives, documents prepared individually such as blog entries with personal reflections, design briefs and collective peer evaluation reports, as well as collective discussion in the forums.

For the analysis of the 50 workshops designed and implemented by MUVEnation participants, the results included

- Fifty design briefs of the workshops organized by the MUVEnation participants
- One hundred peer evaluation reports of the workshops organized by the MUVEnation participants
- Photos of the educational settings and recordings of the workshops
Eighty-one case-stories in the form of personal narratives retelling and reflecting on the design experience.

Results

Part One: Development of the Proto-Analysis Grid for the Design, Implementation, and Evaluation of Workshops

We developed the first or “proto-analysis” grid from the detailed analysis of 25 workshops that covered notes gathered during direct observation and participation in the workshops, photos of the educational settings in which the workshops took place, and 15 interviews conducted with the facilitators of the workshops. The grid itself comprises 27 discrete criteria that are distributed under four main headings, or themes, that relate to the design and implementation of inworld workshops (Table 9.1).

Table 9.1 Guidelines Based on Positive Design Aspects that Aid Navigation and Wayfinding

<table>
<thead>
<tr>
<th>Theme</th>
<th>Guidelines</th>
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<tbody>
<tr>
<td>A. Planning and preparation of the instruction</td>
<td>1. Spatial design and layout</td>
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<td></td>
<td>2. Instructional design</td>
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<td></td>
<td>3. Organization of instructions and discourse</td>
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<td></td>
<td>4. Physical organization of learning material</td>
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<td>5. Business model</td>
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<td></td>
<td>6. Maturity level</td>
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<td>B. Delivery of the instruction</td>
<td>7. Assessment of prior/required knowledge</td>
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<td></td>
<td>8. Pre-prepared activities to meet the knowledge requirements</td>
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<td>9. Prior knowledge</td>
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<td>10. Preparation of user interface and viewing controls</td>
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<td>11. Technical preparation of participants</td>
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<td>12. Conversational flow</td>
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<td>13. Communication dynamics</td>
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<td>14. Movement of learners and teachers</td>
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<td>15. Presentation of outputs and results</td>
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<td>16. Delivery of learning material</td>
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<td>17. Use of tools to deliver both contents’ instruction</td>
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<td>18. Use of media to enhance teaching</td>
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<td>19. Concurrent learner activity</td>
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<td></td>
<td>20. Personalization of learning</td>
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doi:10.15215/aupress/9781771991339.01
Each criterion corresponds to a constitutive element or characteristic recurrently observed across the workshops, for example, the “Physical organization of learning material” refers to the form in which the learning materials are presented and delivered to participants. During these types of workshops learning materials are always delivered in a certain form: instructions in notecards, objects, and scripts. However, this may vary from workshop to workshop. In some cases, an unstructured set of objects gathered in a folder are passed from inventory to inventory, compared to more structured workshops where they may be delivered on demand by “giver” devices or automatically delivered by objects being used by the participants, such as a virtual chair. In order to make the grid a self-explanatory practical device, each criterion is labelled an “activity” and completed by a leading question. The answer, or concrete implementation, is indicated by the “range.” For some activities, the range is a set of alternatives, a continuum of possibilities, and extreme polarities or tensions. The information described under the range is generic enough to be implemented in a variety of ways.

Part Two: Description of the Analysis Grid Criteria as Validated against 100 Inworld Workshop Evaluations

The proto-analysis grid was tested and validated against 100 inworld workshop evaluations. The results of the evaluations led to the finalized version of the grid, which we describe below. The questions on the left of the grid relate to the activity/criteria, and the information on the right represents the range of responses. The complete grid is also freely available for download.5

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5 Permission is granted under a Creative Commons Attribution license to share and remix freely the content of the grid. To view a copy of this license, visit http://creativecommons.org/licenses/by/3.0, or send a letter to Creative Commons, 559 Nathan Abbott Way, Stanford, CA 94305, USA. The grid can be downloaded at http://www.muvenation.org.
Theme A: Planning and Preparation of the Instruction

1. Spatial design and layout

*How is the virtual physical space for delivering the workshop designed and utilized?*

- Emulation of RL
- Free form
- Addressing pragmatics of SL environment

The spatial design and layout of the workshop refers to the structure and appearance of the virtual space. Two types tend to dominate:

1. An emulation of RL settings using objects that relate to a traditional classroom and include, for example, whiteboards, school desks, and sometimes an enclosed space with walls, windows, and doors that resemble a school. This traditional type of environment was often described as necessary by facilitators to provide the learners with a sense of the familiar, to help them orientate themselves to being in-world (Figure 9.1).

2. Most often, however, the design of the workshop space addressed the pragmatics of the virtual environment, determined by limitations to the chat range, individual areas marked with sufficient space between avatars to allow enough room to work and reduce any restrictions in seeing the tutor (Figure 9.2). In addition, some workshops were designed to limit avatar movement, for example, by aligning people in a row or semi-circle with participants required to remain seated. In contrast, other workshops were more freeform and chaotic, allowing participant avatars to move anywhere in the virtual space (Figure 9.3).

2. Instructional design

*To what extent are the learning objectives and outcomes made explicit?*

- Undefined
- Structured

Instructional design refers to the definition of the objectives and outcomes of the training session. In some cases the objectives and outcomes are self-evident in the workshop title and an informal presentation at the beginning.
Figure 9.1 A classroom space that emulates a real-life traditional spatial design and layout.

Figure 9.2 The participants learn how to build a street lamp while working within an enclosed individual area, allowing for comfortable camera movement in a virtual space that simulates a street corner.
In other cases these are made explicit via a support tool that could be a whiteboard (Figure 9.4), or in the notecards containing the instructions that are distributed during the workshop.

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### 3. Organization of instructions and discourse

**To what extent are the instructions and discourse organized in advance?**

- **Spontaneous speech**
- **Speech prepared in advanced**

The organization of the instruction and discourse refers to the preparation of the workshop “script”; this is the step-by-step set of instructions used during the workshop. Although the guidance is commonly provided progressively as the participants advance in their tasks, the tutor’s performance can be extemporaneous, delivered without notes, or the instructions pre-prepared. Among the many advantages of preparing the workshop script in advance is the assurance tutors have in knowing that their discourse is well organized and no important aspects are forgotten. It also provides an opportunity to improve the discourse and reuse it in subsequent workshops, and frees up time during the workshop so the tutor can concentrate on monitoring and helping participants.

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### 4. Physical organization of learning material

**In what form are the learning materials made available to the participants?**

- **Unstructured**
- **Structured folder(s) and giver devices**

Although the materials required to undertake the workshop are often pre-prepared, they can be stored in a folder and structured by categories such as textures, scripts, and logic sequences, or even organized in a hierarchical folder structure (Figure 9.5). Once organized in folders, they can either remain in the tutor’s inventory or be stored in a giver device.
Figure 9.3 A workshop setting where the avatars can freely move around the teaching space. The chat range is demarcated by the boundary of the circular platform.

Figure 9.4 At the beginning of the workshop “Creating a teleport hub and using the Flight Feather,” the tutor presents the learning objectives on a whiteboard.
Figure 9.5 For the workshop “Building a holodeck with the Builder’s Buddy script,” the tutors prepared the materials within a hierarchical structure where basic materials and materials for each scene are clearly indicated.

5. Business model

What is the economic model for learner participation?

Free  By donation  Set fee

Workshops were run using different business models and ranged from “free” to “paid.” However, it was common to see donation boxes available to the participants when “free” workshops were being run. The access to paid workshops was determined by the payment of a fixed fee, and these varied according to the learning provider, the tutor, or the subject.

6. Maturity level | Development version

What is the maturity level of the workshop and its lifecycle?

Alpha  Fully tested

The maturity level of a workshop was defined as the degree to which the tutors felt they had developed a stable and reusable format for their workshops.
and ranged from “alpha” stage to “fully tested.” The level of maturity was closely related to the number of times the workshop had been delivered and was based on tutor appraisals of both the efficiency in delivery of the instructions and also in the participants’ performance.

Theme B: Delivery of Instruction

7. Assessment of prior/required knowledge

*Is prior knowledge assessed? If so, how is this carried out?*

| None | Informal assessment | Formal assessment before the workshop |

Prior knowledge can be assessed before or at the beginning of the workshop. Often, however, during the free access workshops, the tutors had little way of knowing in advance the skill profile of participants. In some cases, tutors carried out an informal assessment of required skills by either asking the students directly or by making explicit the skill level required at the beginning of the workshop. There was scarce evidence of formal assessment of prior knowledge before the workshops, though it was not completely unheard of. Some tutors assessed their participants’ skill profile using a self-declarative questionnaire via notecard or a quiz maker.

8. Pre-prepared activities to meet the knowledge requirements

*What type of pre-workshop activities have been planned to meet the knowledge requirements?*

| None | Self-paced | Directed (Individual, group activities) |

According to the results of the assessment exercise indicated above to assess prior skill levels, tutors invited participants to attend other training sessions or to consult specific resources before the workshop. It was left up to the participant’s responsibility to ensure their skills profile met the workshop’s requirements. As a final resort, in some cases, tutors discouraged potential participants from accessing the workshop if their skill level seemed inappropriate.
9. Prior knowledge

How is prior knowledge recalled and connected to the workshop activities?

Not recalled  On demand  Systematically recalled and connected

Basic workshops teaching Second Life skills do not always require prior knowledge. Where appropriate, tutors recalled and applied prior knowledge on demand while running the workshop in response to the questions that arose. In other workshop situations the tutors stimulated recall of prior knowledge at the beginning of the workshop by imposing a specific task to refresh skills more quickly, for example, thus facilitating the development of new skills and making efficient use of time. It was also possible for tutors to integrate the recollection of prior knowledge into the workshop script (see 3. Organization of instructions and discourse).

10. Preparation of user interface and viewing controls

To what extent are the instructions for organizing the viewer user interface and camera controls given?

No instructions  Structured interface set-up and pre-set views

Tutors fell into two groups: first there were those who did not pay attention to the organization of the participants’ viewer user interface, and consequently provided no instructions regarding the state or locations of windows, nor how to use the camera controls. Second, there were those tutors who chose to help participants to make the best of the user interface by indicating the best locations for the chat history, inventory, and object properties windows. In some cases, tutors used scripts built into objects that could modify the avatar’s point of view to make certain that all participants were directed automatically to look at a precise location.
11. Technical preparation of participants

*What technical advice and background information are provided?*

None

Instructions cover different technical issues

Avatars, AO and HUD, video performance, locations, landmarks, teleports, lag

Inworld workshops can be prone to technical problems due to lag, scripts, and animation interference or conflicts. For this reason, tutors at the beginning of the workshop (or even during delivery) provided the participants with a clear set of instructions regarding critical technical aspects such as:

- Setting the graphic performance of the Second Life client;
- Switching on and off any animation “over-riders” and HUDs;
- Taking off objects that may interfere with the tutor’s notecard readers;
- Providing instructions on using the IM (Instant Messenger) channel; and
- Creating landmarks.

12. Conversational flow

*How is the conversational flow structured between tutor and learners?*

Free and improvised

Ordered and controlled progressively by behavioural interactional rules, textual codes, scripted objects, and communication tools

Conversational flow refers to the organization of the exchange between tutors and learners. The exchange can be free and improvised where participants intervene without constraint. However, with an increasing number of participants these exchanges can quickly become chaotic. When there are more than a handful of active participants in a single chat space, the rapid and unthreaded flow of exchanges makes it difficult to maintain a coherent and productive conversation. Chat spaces are democratic in that anyone can post comments as and when they feel. On the one hand this freedom can be empowering for participants, yet on the other it can reduce the fidelity of the conversation when larger numbers are involved. In order to apply structure to the chat, tutors...
can set ground rules for intervention like asking the participants to label their questions so they are traceable within the chat history, throttling the exchanges by turn-taking or using tools as a question queue, refraining from asking questions until the tutor finishes or allows it, and using or refraining from using the IM channel for asking questions to the tutor (Figure 9.6). Organization, management, etiquette, and maintaining a good signal-to-noise ratio all play a role in successfully navigating synchronous chat to achieve prescribed outcomes.

**Figure 9.6** A question and answer session after a workshop using the “CloseText rezzer” on channel 99 to drop participant questions.

13. Communication dynamics

*What are the dominant communication dynamics during the workshop?*

- Tutor → Learner
- Tutor ↔ Learner
- Tutor ↔ Learner and Learner ↔ Learner

Where exchanges were structured by tutors, we observed several communication dynamics taking place: the tutor provides contact information to the learners whose role consists of following instructions; the learner–tutor relationship is a bidirectional exchange; and finally, learners communicate between themselves during the workshop in a peer learning support-style mechanism.
14. Movement of learners and teachers

How are the movements of participating avatars in the learning space?

- **Free**
  - Constrained sit/position for learners
  - and free movement for teachers
- **Constrained sit/position** for both learners and teachers

A range of constraints can be applied to, or expected of participants during a workshop. These can range from allowing free movement with avatars circulating as they want and building where they feel like (Figure 9.7), to adopting a sitting position on a prim where body movements are constrained (Figure 9.8). Sometimes the tutor circulates freely among the participants, approaching them to answer to a specific question or taking a closer look at their projects (Figure 9.9), mimicking RL since the flexibility of inworld camera controls means this avatar movement is not actually required. Finally, a tutor may choose to remain in a seated position, on a prim, and manage the class using only the camera controls.

![Figure 9.7 Avatars freely occupy a workshop space as they build their own projects.](image-url)
Figure 9.8 During the "Bracelets, bracelets, bracelets!" workshop, the participant sits on a chair and builds her project on a desk.

Figure 9.9 While avatars are constrained to their allotted space, the tutor circulates freely among them.
15. Presentation of outputs and results

*How are the expected outputs and results presented?*

- Not presented
- Presented in a strategic place
- Illustrated at varying stages of development

Examples of the final output of the workshop can be presented in a central location or demonstration area visible to all the participants. Often these were presented on a much bigger scale and situated on the upper area over the tutor (Figure 9.10). In some cases, the stages of development were also shown so the participants could, at any point, compare their intermediate results (Figure 9.11).

16. Delivery of learning material

*How are the learning materials given to learners?*

- On demand
- Progressively
- At the beginning using automated tools and scripts

Learning materials can be provided on demand, often from tutors’ to participants’ inventories, or tutors give them out progressively as the workshop unfolds. In the workshops we reviewed, for the most part materials were delivered at the beginning of the instruction, predominantly by “giver scripts,” objects, or bots that automatically sent the materials required to the participant's inventory. One example of delivering learning materials without requiring specific action from the participants was the use of a giver script built into a chair, which, once the avatar is seated, immediately offers the materials to the avatar’s inventory. Vendors were also used during paid access workshops with participants requested to buy the learning materials while the instruction is then delivered “for free.”
Figure 9.10  During the “Bracelets, bracelets, bracelets!” workshop, the tutor displays the three bracelets on a large scale in the sky overhead.

Figure 9.11  While the participants work on their own projects, progressive stages of development remain visible in the sky to serve as a reference.
17. Use of tools to deliver instructional content

*What tools are used to deliver instruction to learners?*

- Basic SL chat facility
- Presentation tools
- Interactive tools

The chat facility was the most commonly used tool to communicate with participants during workshops. However, text-based exchanges could be enhanced with a variety of tools for delivering content: notecard givers, notecard readers, material givers, whiteboards and slide viewers, interactive whiteboards, html on a prim (from notecards, scripts, or the Internet), video viewers, sound, music, and podcast players.

18. Use of media to enhance teaching

*What type of media is used to enhance/enrich the teaching/learning experience?*

- Basic use of SL text chat and sense of virtual embodiment
- Use of rich media encompassing audio and video

Workshops were not limited to the use of the chat facility and non-verbal communication. Tutors also often incorporated rich media such as audio and video to enhance the largely text-based exchanges. In some workshops, where instructions were automatically delivered via a notecard reader, the tutor used Second Life voice to “speak” to participants to complete guidance and instruction.

19. Concurrent learner activity

*What type of concurrent learner activity is promoted?*

- Activity exclusively centred within the 3D world
- Parallel activity within 2D environments

Tutors had the choice of concentrating participation exclusively within Second Life or developing concurrent activities that involved the use of the Web, for example, from within Second Life or in a parallel window for visiting hyperlinks or to search for scripts. They could also use note-taking within a
wiki, communicating using Voice over Internet Protocol (VoIP), or visiting a course Virtual Learning Environment (VLE).

20. Personalization of learning

What types of activities are implemented to individualize the learning experience?

| None            | Adaptive pathways |

Given the short length of the workshop, most tutors attempted to make the experience good for all participants. However, some tutors attempted to take into consideration the often variable skills of the participants by designing adaptive pathways: ones that gave the slower participants a chance to finish the task at hand while at the same time providing faster learners with the opportunity to progress their activities so they do not get bored. To make this possible, instead of delivering the instruction via the chat facility, the tutors delivered their instructions via notecards. In this scenario the participants could carry out their activities at their own rhythm, knowing that the tutor was present to provide support as and when needed.

Theme C: Follow-up and Evaluation

21. Provision of guidance, support, and feedback

How does the tutor provide support and feedback to the learners?

| None | On demand via main or back channels | Pre-prepared using the tutors’ knowledge base via general or back channels |

As with the delivery of instructions, the tutors can use a variety of communication channels to provide guidance, support, and feedback. When feedback concerned the group as a whole, the tutors preferred the main channel or a group channel. When feedback concerned a named individual, then back channels like personal IM was used. Guidance, support, and feedback were found to be extemporaneous, provided on demand, or else pre-prepared using a tutor’s knowledge base.
22. Monitoring of student progress

*In what form does the tutor monitor student progress?*

None  Gathering of informal feedback  Structured monitoring

As the participants advanced in their session/project, the tutors could monitor their progress by gathering informal feedback via the observation of individual work or by questioning the participants in the main or back channel. Monitoring could be structured in advance by setting milestones and designing means of verification of participant attainment, such as, using polling or a similar technique.

23. Quality of feedback

*What is the nature of the feedback?*

Informative  Formative

The feedback we observed from tutors to students during the workshops ranged from informative—extending the instruction or simply commenting on progress—to formative feedback which afforded the participants the opportunity to modify subsequent learning activities and experiences by being able to act on the feedback they had received.

24. Assessment model

*What is the assessment model?*

None  Informal assessment  Formal assessment

The great majority of workshops observed did not have an assessment component. Assessment was most commonly observed during the paid workshops and those organized by formal learning providers who had the responsibility of delivering a formal certification.
Theme D: Activities for Recalling and Transferring Learning

25. Recapitulation

In what form is the revision of key concepts and procedures addressed?

None          Systematic

At the end of the workshop, the tutor could systematically review the concepts and procedures addressed by either making a summary or delivering factsheets in notecards. Tutors could also make free space available toward the end of the workshop to give to the participants the opportunity to practice on their own with another micro-project or activity designed to review the skills they have developed.

26. After-session resources

What kinds of resources are made available at the end of the session?

Individual artifacts Access to social networks Combination of artifacts and networks

After conducting the workshop, the tutor sometimes provided participants with a set of objects/prims, scripts and/or textures that they could use in the future by applying the same techniques they learned during the lesson. In order to maintain contact with the participants—for dissemination purposes, for example—the tutor could invite them to join a Second Life group or list, or join a social networking community outside of Second Life.

27. After-session activities

What type of post-workshop activity has been planned?

None Individual activity Group or social activity

After conducting the workshop, some tutors proposed post-workshop activities designed to help participants consolidate the skills they developed. These activities varied from individual to group or collective activities. However,
because the freely accessible workshops were often one-off in nature, they were rarely followed up by any kind of activity, except for dissemination purposes.

**Part Three: Using the Grid as a Design Tool for Planning and Delivery of Inworld Workshops**

We completed the final phase of the study by taking the analysis grid and testing its value as a design tool that could potentially be passed on to other educators to help them plan and implement an inworld workshop event or similar teaching activity. Here, the grid was deployed as a rubric in the planning and delivery of 52 inworld workshops that we and the MUVEnation participants designed. The analysis of post-workshop case-stories and recorded feedback from participants strongly indicated the potential value of the grid as a tool for scaffolding the design and then implementation of workshop sessions inworld. The analysis of the case-stories and feedback from the planning, design, and implementation was carried out using content analysis on the transcripts of interviews with teachers and the narratives that were gathered after the participants had delivered their own workshops. This allowed us to create an inventory of codes, and the number of occurrences of each of these coded units was then grouped and ranked. Next we identified key criteria by correlating judgments on the success or failure of the designed and implemented workshop as triangulated by the tutor and participant feedback. This process revealed six key criteria that were shown to have the biggest impact on the success of the workshop. Finally, we mapped and grouped all the criteria to show the interconnections between these critical elements (see Figure 9.12). This mapping activity provided insight into another layer of the tension between the pedagogical approach and teaching expertise versus the technical expertise in controlling the environment.

**Discussion**

The primary purpose of the study was to develop insights into learning and teaching inside virtual worlds, and the vehicle for this exploration was the popular MUVE Second Life where we sited the object of study within the easily accessible inworld workshop-format teaching events. We successfully achieved the observation, analysis, and categorization of workshop planning, design, and implementation criteria into a taxonomic grid, and the subsequent validation activity confirmed the value of the classifications we adopted, as evidenced in the resulting positive evaluation carried out by MUVEnation participants across 100 workshops. The grid itself proved relevant as a taxonomic device.
detailing those factors that are likely to impact most forcefully on the successful outcome of an inworld workshop teaching and learning session. Furthermore, although we designed it as an observation grid with the initial purpose to gain understanding about a specific Second Life teaching practice, the taxonomy could be used successfully to support decision-making processes undertaken during the design and development of new workshops.

**Figure 9.12** Mapping of all the analysis grid criteria is grouped according to theme and relationship to pedagogical or technical expertise. The criteria with the most impact are highlighted in red.

From using the taxonomy as a design rubric, it became clear that certain factors had a higher impact on the success of workshops:

- the technical design of the virtual teaching spaces, particularly the spatial layout;
- the establishment of clear and understandable interaction/communication policies and flows;
- the instructional design and the individualization of the learning experience; and
the setting aside of adequate time for designing and preparing the workshop and then iterating the session to improve and develop its maturity level.

When we more closely scrutinized these elements of success, it became clear that some of the factors corresponded not simply to content but to pedagogical knowledge, and others corresponded to matters relating to the ability of the tutor or facilitator to control the virtual environment. Focusing on the pedagogical aspects alone revealed that one of two distinct teaching approaches tended to be adopted, namely, directive versus reflective learning:

<table>
<thead>
<tr>
<th>Pedagogical approach</th>
<th>What are the relevant aspects of the learning and teaching approach?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directive</td>
<td>Focused on rules and procedures</td>
</tr>
<tr>
<td></td>
<td>Results-oriented</td>
</tr>
<tr>
<td></td>
<td>Simple</td>
</tr>
<tr>
<td>Reflective</td>
<td>Focused on concepts</td>
</tr>
<tr>
<td></td>
<td>Process-oriented</td>
</tr>
<tr>
<td></td>
<td>Sophisticated</td>
</tr>
</tbody>
</table>

When examining the results, we identified an interplay between technical skills, visible in the ability of the tutor to control of the virtual space, and the sophistication of the pedagogical approach he or she adopted (see Figure 9.13). The majority of criteria within the analysis grid relate to control—for example, the more controlled the virtual environment was, the easier it was for participants of a workshop to engage in the learning experience. It was also evident that the success of the learning experience directly related to the tutor’s pedagogical approach. A reflective, process-oriented teaching approach was more successful in transferring skills than focusing on a precise outcome such as a particular object. Participants may want to learn how to build furniture, not just a specific type of chair, and therefore the objects are the means to learning, not the learning itself.

These two polarities can be plotted against each other. The first axes represents control of the teaching space and ranges from unstructured to structured versus the broad pedagogical approach that ranges from a directive, results-driven approach to one that is process-based and reflective (Figure 9.13).
Moving towards good practice in implementing a ‘hands-on workshop’ in Second Life

The two axes produce a matrix divided into four areas that reveal four potential profiles for learning and teaching in virtual world settings based on practitioner skills and activity. Each quadrant describes a specific scenario:

1. **Unstructured space + reflective learning**: Confusing. A disorientating space for the learner and a hard one for the tutor to teach in. An approach often taken by the innovative educator who does not possess Second Life technical skills.

2. **Unstructured space + directive learning**: Cognitive overload. Adopted by the more behaviourist inclined tutor who lacks experience inworld. An approach adopted by the inexperienced tutor who is struggling to master Second Life.

3. **Structured environment + directive learning**: Mechanical. The most common situation: not innovators, these tutors take a simplistic teaching approach but do possess a more than adequate mastery of the Second Life environment.

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**Figure 9.13** Pedagogical approach versus structure of the environment: moving toward good teaching practice (quadrant 4) in a virtual world setting.
4. **Structured environment + reflective learning**: The ideal situation. An innovative tutor fully trained in the use of Second Life and able to master the virtual environment.

What the matrix reveals is a particular area, quadrant four, that indicates where good teaching practices in a virtual environment such as Second Life should lie. The design and delivery of the ideal session is one where the tutor is confident not only in the session's content but also in the sophistication of her pedagogical approach and technical mastery of the virtual setting. This finding resonates strongly with the work of Mishra and Koehler (2006), who proposed a conceptual framework for educational technology that extended Shulman’s (1986) well-known formulation of “pedagogy content knowledge.” Mishra and Koehler’s (2006) framework tried to capture the essential knowledge required for technology integration in teaching, while at the same time addressing the complex and situated nature of this knowledge. They termed this Technological Pedagogical Content Knowledge (TPCK) and it is this combination of capacities that is reflected in what expert teachers bring into play. Like the tutor approaches uncovered in quadrant four of the matrix above, the TPCK framework shows us that quality teaching requires this nuanced understanding of the complex relationship between technology and pedagogy.

**Future Directions and Conclusion**

The analysis grid has provided a tool for understanding the wide range of practices and tools related to the design and implementation of workshops situated inside a virtual world setting such as Second Life. It highlights those that impact on the quality of the learning experience measured via the level of satisfaction of students and the successful completion of the assigned tasks/objectives. The grid has not only proven its utility for self-assessment and evaluation but also for design. It shows the different alternatives that the tutor has when designing the workshop, and in this way has proven its value as a tool to help workshop planners to design and implement their sessions. Despite the apparent familiarity of the virtual setting, RL teaching experience does not guarantee Second Life teaching expertise. The plotting of the two key polarities of technology and pedagogy allowed us to identify the appropriate level of structured design of the teaching and learning environment and the promotion of process-based learning approaches. It is clear that workshops do require a high level of preparation, and are somewhat unpredictable. Tutors can never be fully prepared for what a workshop might hold in store: they have few means to anticipate the
number of attendees or ways to know what their skill level will be. But using the grid as a design tool has shown value in mitigating unexpected surprises. Finally, like the work of Mishra and Koehler (2006), this study suggests that advancing the inworld teaching skills of tutors can be accomplished through a learning-by-design approach, and that technology skills should not taught out of context and in isolation.

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