

# Teaching What Shouldn't Be Taught

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## The Situation

As a Curriculum Manager for a successful open source software company, I was charged with designing and developing training materials for delivery to customers seeking an understanding of how to extend, customize and maintain our suite of Java™-based middleware software products. In addition, my job description included a twenty-five percent teaching allocation. For me this was a bonus because I got to teach adult learners in the classroom. For the company, it was a necessity – after all, how could one be expected to design materials for an audience one was not in touch with? I had accepted the role because I could not abide the abysmal quality of the existing teaching materials and felt compelled to fix them and improve our training program.

Educating consumers in the proper care and feeding of complex software is a difficult and demanding task as there are many interdependent knobs and levers to fiddle with and it is easy to overwhelm the students by providing too much information. Adding a layer of abstraction by teaching customers how to construct their own creative endeavours to work inside the systems and frameworks we provide makes this task even more difficult. However, trying to do this using materials that were poorly organized, outdated and often incorrect or even broken – while not disparaging your company – requires creativity.

Furthermore, the original content developers had no instructional design skills – or any expressed understanding of motivation or application of motivational theory. The materials resembled brain dumps from the software developers with respect to the course topic and none had seen significant revision since inception. Anecdotally, the founder of the company is said to have authored the first class the company sold, an introduction to building custom middleware applications, himself on the airplane to our first training engagement. The authors had interesting and complex topics that obviously engaged them, but none of this seeped into the printed materials.

These materials should never have seen the inside of a classroom and yet it was my job to deliver and ultimately replace them.

## Teaching the Classes

Each class ran anywhere from three to five days in length. The single most important factor in successful course delivery proved to be preparation. One must not only know the material, but also know where it was outdated, inapplicable, incomplete, uninteresting or simply incorrect. The labs were even more problematic as one had to know beforehand where they would break

and why they broke if we were to turn these embarrassments into strengths. After running through the course books and testing the labs, occasionally an issue was correctable in the short term, but mostly this was not the case. Many of the problems were structural in nature and would require a significant development effort to repair or, in many cases, replace.

It was important begin each class with ice breakers to build group cohesion and raise the engagement level. As the participants were adult professionals, these were generally limited to name, company, projects they are working on using our technology and what they hoped to get from the class. Although these icebreakers were not particularly exciting, they did prompt self-disclosure which resulted in investment and buy-in. This was locked in by my responses, which validated their interest and the complexity of the topics while informing the participants of the point in the syllabus at which their specific needs would be addressed. Based upon their responses, I might further probe their experience with the products for later use. Students tended to be especially interested if they heard that one of the labs provided them with hands-on time engaging with related content. It must be noted that our enrollees tended not to lack motivation for two reasons:

1. Students generally found their way into our classes because they were (or soon would be) using our products at work and their jobs depended upon the skills we offered.
2. The classes afforded them a break from their daily routine with relatively few demands.

Beginning chapters were always largely introduction and establishment of a shared vocabulary – including numerous TLAs (Three Letter Acronyms). Students often have a hard time seeing the applicability of the concepts immediately and I always ran the risk of losing them, so I made an effort to foreshadow the coming material by providing shortcuts and memory aids (e.g. Java Management eXtensions or JMX = Service) which I referred to numerous times in later discussions where I used informal quizzes to lock in the knowledge. At other times, learners were prompted to share their own experiences or attempt to answer tricky questions from the text, often requiring them to make predictions based upon their understanding of the system(s). These forms of audience participation assisted the students in committing the terms to memory and in retaining the concepts.

The first lab activity was invariably simple and ran the smoothest because few techniques had yet been introduced. As a result, I was able to build their confidence by stepping back and allowing the students to help each other get through. When all completed the lab, the most able student was tapped to take my place and walk the students through the lab. This technique would be repeated throughout the course with variation in my level of involvement in student completion. Those labs that were not written properly often required that fixes be applied and explained. In cases where icebreaker disclosure and demonstrated skill indicated a

high probability of success, I sometimes asked a student to demonstrate a variation upon the proscribed activity and to explain the process. Empowering the stronger students to teach those having difficulty, knowledge was reinforced in both parties while also freeing me up to handle some of the more difficult technical issues.

Some discussions and topics had a tendency towards lengthy abstractions, which made it difficult for participants to understand and retain the content. In these circumstances, an effective tactic was to take advantage of some sort of role-play. For example, Java™ memory management is a complex yet crucial topic as small changes to these settings can have a drastic impact upon the throughput (or data processing rate) of a system. In this case, each student became a thread, or *important object*, within the system. Instead of talking about how the *Garbage Collector* examines each object, I assumed that role and polled them for the objects in their environment that were still in use and collected and disposed of those which were not.

Preparation enabled me to foresee where students were likely to need help and to keep the answers at the ready for those situations. It provided me with the confidence in my own skills to allow others to step in and take my place while I monitored and provided support only as needed.

## Fixing the Materials

Role-play became a central component of the redesigned course materials. Instead of students entering a classroom, our redesign challenged our students to assume the identity of a new programmer or administrator. The labs were replaced with mandates, requirements and deadlines dictated by the business side of their new fictitious employer. In all cases, the new materials furnished them with a minimum set of activities to complete plus a set of bonus activities, challenging them to explore their new world. These tasks were often relatively open-ended and might make things easier in the future despite not being required. The learners had greater control over their environment and which objectives they strove to achieve.

Audience participation moved into a more central role as well because some of the new activities consisted of facilitated discussions (e.g. explorations of what other roles/departments one must interact with and how they can do so most effectively?). In some cases, the content was even provided in non-linear fashion, forcing the “new employees” to decide how to approach the problems and even the sequence.

## Conclusions

Through the creative application of motivational, critical thinking and collaborative techniques I was able to successfully navigate a difficult environment. The keys to my favorable outcome

included learner motivation through active engagement, self-disclosure, role-play and prediction. All of these techniques were made possible through advanced preparation for each class.