There is a great deal of talk in science education about the problem of constantly reinventing the wheel, that is, individual teachers or curriculum development projects often seem to be doing the same thing over and over again, coming up with new ideas that aren’t very new at all, that are just slight variations on ideas that have been around for a long time. This seems to be a waste of time, just as the project of reinventing the wheel would be. If a solution to a problem has already been found by one teacher or one project, why not just make use of it, instead of starting from scratch yet again.

**Thinking about Evolution & Teaching**

Better communication among teachers and more effective dissemination of curriculum designs is often seen as the solution to the reinvention of the wheel problem. But I had an experience last summer that made me think that reinventing the wheel may not be such a bad idea after all, and that it may even be an essential part of curriculum design and of an individual’s development as a teacher. I was at a workshop on teaching evolution in college biology classes sponsored by the BioQUEST Curriculum Consortium at Beloit College. During the course of a week, some 40 biology educators broke into groups and worked on projects dealing with different approaches to teaching evolution, particularly to undergraduates. One group tackled the problem of what essential concepts should be included in a course on evolutionary biology. Because they wanted to use active-learning approaches, they reasoned that content would need to be, if not sacrificed, at least streamlined, and so they set out to come up with a bare-boned list. But the list turned out to be quite long, with 17 major concepts that needed to be covered, most with a number of subheadings of auxiliary concepts that couldn’t be left out; proving once again that reducing course content is never easy.

After the group created this preliminary list, I joined a couple of other people to give our thoughts on it and to develop a concept map of ideas on evolution. Now this is really reinventing the wheel in its most extreme form: reworking a list that has just been developed, to say nothing of the fact that the National Academy of Sciences has recently published a book, *Teaching about Evolution and the Nature of Science* (Working Group on Teaching Evolution 1998), and there is *Evolution, Science, and Society: Evolutionary Biology and the National Research Agenda* sponsored by the National Science Foundation and the A.P. Sloan Foundation ([http://www.rci.rutgers.edu/~ecolevel/fulldoc.html](http://www.rci.rutgers.edu/~ecolevel/fulldoc.html)), to name just two of the initiatives in evolution education. It seems like hubris for a group of us to be sitting around a lab trying to produce yet another framework, but despite its apparent futility, this was nonetheless a wonderful exercise. First of all, each of us had very definite ideas about what to teach and how to teach it, and none of us seemed shy about voicing our opinions. We each had thought hard about concepts in evolution and how best to present them to students. Of course, by the end of our discussion we hadn’t come to a complete consensus, but I think we all considered the experience exhilarating and useful. We had shared a great many ideas in a way that we rarely have the opportunity to do.

**The Wheel Metaphor**

There turned out to be something very satisfying about reinventing the wheel which got me thinking about this metaphor and its limitations. Yes, it does make a point. Reinventing the wheel can be a waste of time. If someone else has found a better way to teach about sexual selection or population genetics, then it makes sense to use that approach rather than wasting time developing a lesson that may not be nearly as effective. That’s why it’s important for teachers to publish their ideas in journals like *ABT*, and also increasingly, on the Web. But that doesn’t mean that reinventing the wheel is always a waste of time and therefore should always be avoided. At Beloit, we found our exercise in reinvention to be very effective. We all learned a lot—about how concepts in evolutionary biology relate to each other, as well as different ways to approach these concepts.

The reinvention of the wheel metaphor, like all metaphors, has shortcomings. A metaphor is a comparison between two unlike subjects—in this case curriculum design and creating a piece of technology. One of the dangers with any metaphor is that the similarity between the subjects will be mistaken for identity. Yes, creating an evolution course and creating a wheel are alike in that they both involve planning, as well as consideration of the necessary materials and how to