

The difference between explaining theoretical physics or math and explaining other subjects

I think there is a big difference between explaining theoretical physics or math and explaining humanities subjects, such as history or literature. In theoretical physics or math, if you "got it," you "got it." Once you "got it," you can explain it in any way you want. You can make up any examples you want or you can explain what is going on by using your own words, which are all valid because you "got it."

However, in humanities subjects, even though you may have "got it," your explanation may not be correct. Suppose you are a history teacher, and you are going to explain something by citing examples from history. Not only can't you make up examples, but also you may not know about the events in detail, or even, you cannot be 100% sure about what actually happened. You think that the political motivation why so-and-so took such a political action might be such-and-such, but you are not 100% sure. Then, do you have to skip mentioning this, because you are not sure? Then, nothing will be left for the fun and important part of learning history. Then, do you really have to mention this? Sometimes not, if your guess is too far-fetched, or you are not sure and cannot support your idea by historical evidence. Nothing is certain as long as you are not omniscient. History should not be a novel, but it must not be an enumeration of boring facts either. Sometimes, finding the right balance is hard. You encounter similar problems when you are teaching literature. Are you sure that that is the message of the author? Are you sure that that was the motivation behind the behavior of the protagonist?

When I told a friend of mine that I was writing textbooks on physics and math alone, and had already written more than 900 pages, she remarked that it was impressive because textbooks are usually written by many co-authors in her major (diplomacy). I think this is the precise reason why. If you know about a sub-subject in diplomacy very well in detail, it will be enormously helpful in writing chapters on that sub-subject in low-level, introductory textbooks. On the other hand, if you know about a sub-subject in theoretical physics very well, it will not be that helpful in writing chapters on that sub-subject in low-level, introductory textbooks, even though it will be extremely helpful in writing advanced textbooks on that subject. Regarding the materials for low-level, introductory textbooks, even though you "got it," you may not have "gotten it" any better than the other physics experts on the other sub-subjects, who also "got it."

Indeed, the most popular basic physics textbook series were written by one or two authors. Like Landau and Lifshitz series and Feynman series. Of course, they are very renowned physicists, and that must be very helpful in writing textbooks, but their textbooks are great, not because they possessed specific knowledge that could have been presented in the textbooks, but because they had insight and depth, which facilitated their approach to the problem and eased their explanations.