Pianos, not Orchestras

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ABSTRACT

Would you rather that your children learn to play the piano, or learn to direct an orchestra? In this paper, I apply the poor learning environments perspective to this question. I conclude that learning environments should be like pianos, not orchestras.

Keywords

education theory, theatre theory, software design, poor learning environments

INTRODUCTION

Resnick, Bruckman, and Martin begin their paper, "Pianos Not Stereos: Creating Computational Construction Kits," with a simple question:

Would you rather that your children learn to play the piano, or learn to play the stereo?

The stereo has many attractions: it is easier to play and it provides immediate access to a wide range of music. But "ease of use" should not be the only criterion. Playing the piano can be a much richer experience. By learning to play the piano, you can become a creator (not just a consumer) of music, expressing yourself musically in ever-more complex ways. As a result, you can develop a much deeper relationship with (and deeper understanding of) music (Resnick, Bruckman, & Martin, 1996).

They go on to show how computational construction kits can enable a new class of piano-like environments to be produced. While I wholeheartedly agree with their position that educational software designers should try to produce pianos and not stereos, I feel the more dangerously seductive rival for the piano is the orchestra, not the stereo.

Would you rather that your children learn to play the piano, or learn to direct an orchestra?

This is a much tougher choice; the orchestra is more tempting than the stereo. Like playing the piano, directing an orchestra can be a rich experience. By directing an orchestra, you also become a creator (not just a consumer) of music. As with the piano, you might even develop a deeper relationship with music. Additionally, directing an orchestra has a seductive novelty, because only a limited few have the means to do it.

Creating rich and complex orchestra-like environments follows the current trend of software systems. However, despite the numerous interesting technical issues that would arise evolving such systems, it is not a fruitful design strategy if what we (educational software designers) want is personal commitment and deep understanding.

POOR LEARNING ENVIRONMENTS

There exists a deep analogy between theatre and education. With this analogy, theories in either domain can be translated into corresponding theories and inform the practices of that other domain. Because theatre has several advantages over education, mapping theatre theories into the education domain is particularly informative.

Here, I focus on the theatre theory of Jerzy Grotowski, whose work revolutionized the way many thought about theatre (Grotowski, 1968). I translate his theory of a poor[(1)] theatre to arrive at a design theory for educational technology called poor learning environments (PLEs); in particular, I find that Grotowski's poor design aesthetic is useful for designing learning environments that encourage *personal commitment* and *deep understanding*.

In many modern theatres (both community and professional stages), the performance of a play has been trimmed to its surface elements. With around four weeks of rehearsal, the actors barely have time to memorize their dialogue and the scenic action. Almost all of the deep work on character, plot, and theme has been ignored in favor of the surface-level elements that are the least common denominator for a performance to take place. Grotowski posits that this alarming trend is due to the modern stage trying to compete with its successful spin-off, the screen of the cinema and television. He finds that the stage has been trying to compete with the screen on exactly the qualities that the screen will always beat the stage—in richness.

[(1)] In Grotowski's sense and the one used in this paper, "poor" does not mean "bad." Instead, it simply means "a lack of wealth."

Grotowski's remedy is simple: "If it [the theatre] cannot be richer than the cinema, then let it be poor." Instead of trying to compete on surface elements, Grotowski shifts the focus of the stage theatre back to the actor and the essential power of the actor to convey emotions, feelings, and ideas. As such, he asserts that the stage does have a place without having to compete with the screen on its terms.

Just as Grotowski finds that the modern stage has deteriorated because of its focus on superficial elements, I find the modern education system to be lacking. Because of the screen, the stage has tried to satisfy viewers with ever decreasing attention spans that demand action and immediate gratification. Similarly, as the amount of knowledge in the world has increased (in some fields dramatically), more and more is seen as common knowledge for every student to have a glimpse of. Instead of deeply understanding domains, today's students are being exposed to so many fields that no field can be covered thoroughly enough to be deeply understood. Instead of really understanding systems and how separate elements work together, students are bombarded with surface-level knowledge that is easy to test. In theatre, the emphasis of the screen on surface qualities, such as looks and special effects, has encouraged stage performances to try to match those qualities. In education, quiz shows, like Jeopardy™, encourage the notion that what makes a person "smart" is being able to answer many questions across numerous fields. This enforcement of surface-level traits causes society to forget what is really important—communication of ideas and deep understanding.

My remedy for education is the same as Grotowski's remedy for theatre: let it be poor. I claim that Grotowski's sentiment should be applied to computing environments too; we should create poor computing environments.

PIANO AS POOR LEARNING ENVIRONMENT

What makes the piano a better learning environment than the orchestra for learning music? The PLEs perspective allows us to answer this question: it is poorer.

The piano is the poorer instrument, because it simplifies much of the essence of music. You can only play notes on the scale. The pattern of octaves is easily evident from the layout of the keys—12 keys up equals an octave up. It is fairly easy to strike a key and have the note sound pleasing. Even the tuning is simplified; pianos are usually tuned to sound equally pleasing in any key, while other instruments would sound unpleasant if tuned that way. The piano's sound is not changeable and notes will only sound slightly different depending on how they are struck. In contrast, orchestras contain many instruments that are better suited for producing certain sounds. An orchestra can produce a richer fuller sound than a piano.

Even if it was possible for a novice to control an entire orchestra, playing the piano is the better choice for deep understanding of music. Although instrumentation might be better explored by directing an orchestra, it is a relatively surface-level feature of music. Understanding how notes relate to one another in a systematic manner is more important for understanding how music works and what it takes to really create (compose) music. For this, the poor piano is better than the rich orchestra. Furthermore, the orchestra would not match the deep personal commitment that some novices develop for the piano, because deep personal commitment requires more than mastery of surface-level features.

Computing environments can offer rich learning environments that are impossible without computers. Computers could be used to create an environment where a novice can direct an orchestra (if only virtually). The PLE perspective informs us that, though this is a possible direction for software development, it is not the most fruitful direction if what you want is deep understanding and personal commitment. Instead, computers should enable new kinds of pianos—poor learning environments where the learner can directly engage the domain to achieve deep understanding.

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