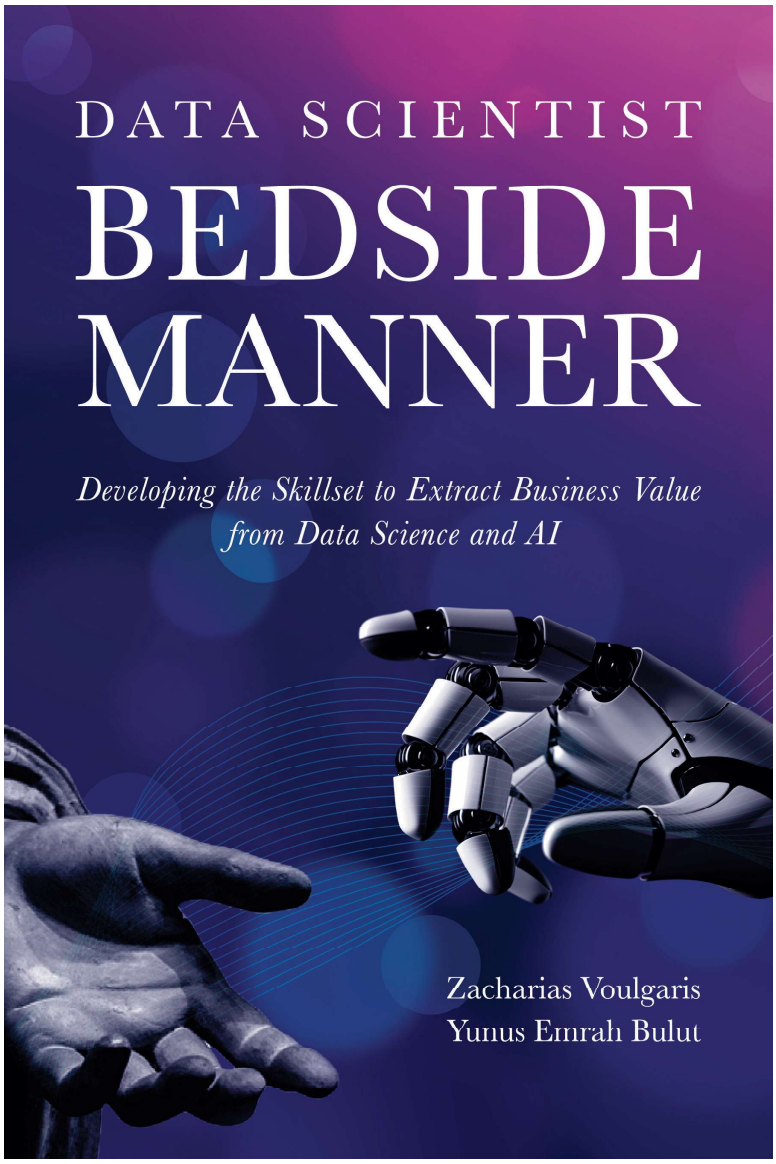

Data Scientist Bedside Manner

Developing the Skillset to Extract Business Value from Data Science and AI

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CHAPTER 11

Educational Resources

In this chapter we'll explore the various options when it comes to educational resources, some criteria you can use for discerning the most reliable ones, the best options for educational resources for data science and AI, depending on your role, and some other useful considerations.

Selecting educational resources

Educational resources are essential for keeping up with the latest developments in data science and AI as these fields are constantly changing. What's more, there is a large variety of tools used for data science tasks and it's difficult to gauge what's relevant enough to be useful. Unfortunately, many information sources are unreliable or incomplete, so special care must be taken when picking a resource for this purpose. This applies both to someone working as a data scientist and someone managing a data science division.

The value of proper educational resources lies in the quality of the material available. With the democratization

of technical knowledge came the inevitable drop in quality. However, this is not an insurmountable issue and there are viable strategies for selecting trustworthy resources and using them effectively in your data science or AI learning.

Types of educational resources

There are various types of educational resources when it comes to data science and AI. In the following diagram (Fig. 6), you can see a taxonomy of the most important types.

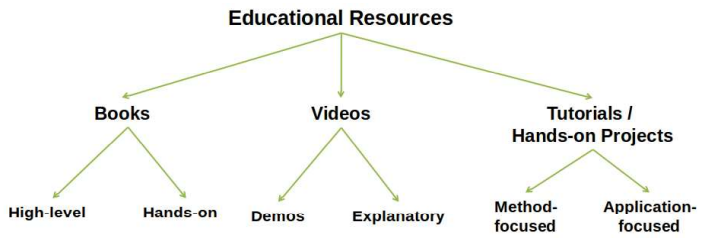

Figure 6. General taxonomy of the most important and widely used educational resources for data science and AI

The value of each of these resources depends upon the target audience. In general, books appeal more to serious learners who wish to go into some depth on a topic, videos for people who want to get a general idea before they delve deeper and who have limited time, and tutorials and

hands-on projects are aimed at people who want to learn specific practical things about certain methods.

As you may suspect, these different resource types have different purposes. High-level books are better for getting an understanding of the topic and developing the right mindset, while hands-on books are geared towards technique. Demo videos are better for understanding why something is used, while explanatory videos can teach the justification for a method. As for tutorials and hands-on projects, the method-focused variety is better for helping the learner understand how a particular methodology works in practice. Complementary to these, the application-focused ones are ideal for depicting how a known methodology is useful for specific scenarios. Ideally someone would use all of these throughout his career.

In a data science or AI course, you generally encounter all of these mediums. Of course, how much depth you want to go into depends on your role, since a manager, for example, doesn't need to know the ins and outs of the various methods, but a data scientist or an AI expert would need to know about the methods.

Criteria for selecting an educational resource

But how exactly does one select an educational resource to use, be it for getting the know-how to become a data scientist or for learning enough about the field to work with data scientists? As the time required to go through many of these resources is substantial, it's best to make an effort to prioritize, otherwise you may end up wasting a lot of time and effort. So, we recommend that you employ at least a few of the following criteria in making your decision:

- Criteria based on content creator:
    - Education level of the content creator
    - Experience, especially related to the creation of educational content
    - Charisma or style of the content creator
- Criteria related to the content itself:
    - Breadth of coverage
    - Depth of coverage for more specialized resources
    - Applicability of the material
- Theme-related criteria:
    - Primary focus
    - Connection to business aspect of the craft
    - Use of comprehensive examples
- Additional criteria:

- References used
- Price of the resource
- Time required to find the resource
- Other factors

Beyond these criteria, there are others that may be more domain-specific, such as the resource's relevance to a particular field, such as e-commerce, or the data involved. Nevertheless, this list of criteria can shed some light as to what is worth your while, helping you discern the most suitable educational resources from the less useful ones.

Educational resources to avoid

Although which educational resources you select depends on your own set of requirements and constraints, there are some useful rules of thumb about which ones you are better off avoiding altogether.

For instance, resources that are free are generally not a good alternative for a number of reasons. Apart from the fact that they usually don't have any quality control, they also are often developed as a vanity project of the content creator, who at the same time won't usually have much experience in creating educational material. What's more, there are so many such resources available that finding one that is marginally good enough is a time-consuming project not worth your time.

On the other side of the spectrum, resources that are developed quickly and for the primary purpose of making money—for example, most YouTube videos and most projects from subscription-based publishers—are also not a viable option. That's not to say that all of these educational resources are bad, but the good ones are few and finding them can be quite challenging. Also, they generally lack the professionalism of other resources, created by more serious authors.

Finally, resources that are too academic, although they may be useful for university students, are not at all useful for industry. This is partly because they focus too much on techniques rather than applications. They can also be more detail-focused, making it difficult for someone unprepared to get something useful out of them. Still, if you are used to this sort of material, academic resources (as for example textbooks) may add to your learning.

Options for educational resources

Educational resources for data science

When it comes to data science, there is a plethora of options out there for educational resources. From books to videos to tutorials, the range is large. However, before you delve into any one, it's best to organize them in terms of

their objectives and think about what's more necessary for you or your teammates at this particular time and to prioritize them.

Namely, the key educational resources in data science are largely dependent on what your role is exactly. So, based on that, you may want to explore the following options, ranked in terms of relevance:

If you are a practitioner within a data science team:

- Books, particularly those related to more specialized methods, for niche know-how you wish to cultivate
- Videos, especially those delving deeper into the concepts explored
- Tutorials, particularly those dealing with essential methodologies used in data science projects
- Hands-on projects, especially those related to newly learned methods
- Conferences on data science and programming

If you are a team lead for a data science team:

- Books, particularly those related to the bigger picture or specialized methods

- Videos, especially those delving into high-level topics and leadership
- Conferences on data science and programming, particularly domain-specific ones
- Hands-on projects, especially whenever a leadership role is required

If you are a manager involved in data science projects:

- Videos, especially those delving into high-level topics and leadership
- Some specialized books, dealing with data science from a business perspective
- Conferences on data science, particularly domain-specific ones

Educational resources for AI

As AI has boomed over the past few years, the options in this area are quite vast too. Although most of them are focused on some very particular aspects of AI, you can find other, less specialized educational resources too. Yet, like in data science work, which resources are most suitable for you depends on your role in these AI-related projects. Here are our recommendations, ranked in terms of relevance.

If you are a normal member of an AI team:

- Tutorials, particularly those dealing with essential systems used in AI-related projects
- Videos, especially those delving deeper into the concepts explored, while helping develop an intuition of the systems described
- Books, particularly those exploring different frameworks and systems
- Hands-on projects, especially those related to newly learned methods
- Conferences on AI and programming

If you are a team lead for an AI team:

- Videos, especially those delving into high-level topics and computational resource management
- Books, particularly those related to the bigger picture or specialized systems like domain-specific applications
- Conferences on AI and programming, particularly application-oriented ones
- Hands-on projects, especially whenever a leadership role is required

If you are a manager involved in AI projects:

- Videos, especially those delving into high-level topics and leadership
- Conferences on AI, particularly application-oriented ones
- Some specialized books, dealing with AI from a business perspective

General educational resources

Some educational resources are more general and often have more to do with specific tools or, conversely, with the mindset needed for the process of analyzing data. For example, any book, video, or tutorial on a programming language usable in data science or AI would be a potentially useful resource to consider. Such languages are Julia, Python, Scala, and to some extent R, though the latter's applicability in AI is somewhat questionable. These educational resources are particularly useful for the more hands-on professionals within these fields.

What's more, conferences in these areas, even if they are more geared towards a particular programming language, can be a great educational resource too—for example, the JuliaCon conference for the Julia language. However, the role of such a resource is more supplementary since it's

doubtful that you can learn the fundamentals of data science or AI at such a conference. Still, you may be able to pick up some useful ideas as well as get a better understanding of how certain methods are applied to specific problems. Often the people participating in these conferences are seasoned professionals and have a great deal to share, so networking with them is an added bonus to the educational benefit of the conference.

Finally, certain data science and AI meetups are also worth considering, particularly those organized by independent professionals in these fields. Such events can be more accessible than most conferences, while they are significantly more frequent, and sometimes equally educational. Although most of these meetups are geared towards hands-on professionals, they can sometimes appeal to those in leadership roles too.

Tips

When selecting and using an educational resource for data science and AI, there are some useful things to keep in mind, in order to make the most out of that resource. First of all, a resource that may be ideal for one individual may be substandard for another one, even if they share the same criteria.

In addition, easier doesn't necessarily mean better when it comes to data science educational resources. If you have an aversion to challenging material, perhaps you are better off seeking help through a consultant or a good mentor. Also, some of the material may be easier than the more advanced stuff people often talk about lately, but you can't rely on the easy stuff only if you want to do something useful with data science or AI. This is particularly valid for hands-on professionals in these fields.

Moreover, it would be best to be skeptical about expedited courses on data science and AI, promising sufficient expertise in these areas within 10 weeks, even if you're a beginner in programming. These boot camps are generally fairly shallow and too focused on technique, while they care more about the revenue they can make from their students than any pedagogical outcome. Naturally, not all of the data science and AI courses out there are useless, but unless you have internalized the data science mindset, it's doubtful they are going to help you much, at least not enough to be worth the money you spend on them. Besides, their role is more supplementary than anything else, regardless of how they are marketed.

Furthermore, understanding the business aspect of data science and AI is a long process that cannot be learned just through a few educational resources. Such an endeavor requires a lot of contemplation on real-world problems, fruitful discussions with people adept in the field, and a

great deal of practice. A good book or video may help, but it's doubtful that it will make you an expert in this or any other arcane aspect of the craft.

Finally, it's best to make use of a variety of educational resources in your data science learning efforts. Videos, for example are particularly good and they convey a lot of information in little time, but you'll usually need something more substantial too if you want to optimize your learning of the field. After all, unless they go in-depth on the topics they delve into, their role is usually supplementary too, just like most tutorials out there. That's why every content creator worth her salt would advise you to practice everything you learn, in order to understanding concepts in depth and learn to apply them, whether it is something hands-on or more high-level.

Key points

- The rapid growth of the fields of data science and AI has made any reliable education in them challenging, while the vast amount of options has turned the choice of resource to use into a daunting task.
- The value of proper educational resources lies in the quality of the material available, something that

may not be as easy to gauge without a set of criteria covering different aspects of these resources.

- There are various types of educational resources when it comes to data science and AI, such as books (high-level and hands-on), videos (demos and explanatory), and tutorials and hands-on projects (method-focused and application-focused).
- Each type of educational resource has its advantages, though it is best to make use of a variety, since they generally complement each other. Courses are one way of effectively accomplishing that.
- There are various criteria for selecting an appropriate educational resource for your data science or AI learning, such as the experience of the content creator, particularly in content creation, the applicability of the material, the focus of the resource, and the resource's price.
- Certain resources are best avoiding, such as free or freemium resources, resources designed for easy money-making for their creators, and resources that are too academic.