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## EXPOSURE TO ONLINE CLASSES AS A DETERMINANT OF STUDENT PERCEPTIONS

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### ABSTRACT

*There is little research comparing the perceptions of university students who have been, and have never been, exposed to online classes. We show that about half the students surveyed, who have never taken online classes, have done so intentionally. We measure the perceptions of both groups of students along ten dimensions. The three dimensions along which the exposed students had a significantly favorable perception were a) the extent to which online classes utilize teaching materials personally created or structured by professors, b) the extent to which students feel frustrated by technology, and c) the benefit of interactions with fellow classmates.*

### INTRODUCTION

Research into online education at the university level and the perceptions of its many stakeholders—students, professors, administrators, staff, and publishers—is rich in interesting and useful insights. The first instigators were administrators and faculty; the former seeking higher enrollment at lower cost; the latter intrigued by new technological opportunities, not to mention the promise of flexible teaching schedules and mobility. This is exemplified by one of the authors teaching his online courses one semester while traveling to San Francisco, Germany and Morocco. In the limiting case, the online instructor would not have to reside in the same city, or even the same country, as the physical location of the campus would require for traditional courses. This flexibility was considered to be equally applicable as a benefit to the student body. In fact, one would suppose that students prefer this mode of learning over the traditional face-to-face mode. In this paper we shall investigate these expectations and related hypotheses.

Research on student perceptions has revealed results in a variety of areas. One area focuses on student perceptions of useful and challenging characteristics aimed at improving online learning in general (Song, *et.al.*, 2004). Another looks at student perceptions in particular courses, such as accounting (Flynn, *et.al.*, 2005) and computer programming (Maltby & Whittle, 2000). Schmidt assessed student perceptions and learning outcomes of traditional face-to-face versus online teaching (2002). Osborne compared student perceptions with faculty perceptions(2009).

The existing research is basically aimed at improving the design and delivery of online teaching. It is clear that some students have resisted taking online classes; but the evidence is, for the most part, anecdotal. There are a few references in the literature (such as Muilenburg & Berge, 2004) to students who have never taken online classes, but the researchers' focus has

been on students who have never had a chance to take such classes. The implication is they should be given the opportunity, *viz.* "...they may be especially pleased with this pedagogy as it accommodates their learning-style preferences" (Cicco, 2009). One should not assume, however, that students who have not taken online classes have done so because of a lack of opportunity; again, we decided to investigate the characteristics of the group who chose not to take online courses. Little research has been done on the perceptions of such students regarding online classes. Likewise, do we not know much about how the above perceptions compare to those who have taken on-line classes. This study aims at filling this gap in the context of undergraduate education at the Craig School of Business (CSB) at California State University, Fresno.

## RESEARCH QUESTIONS

To this end, we gathered data and formulated and tested hypotheses to answer the following questions:

1. What proportion of students at the CSB have never taken online classes?
2. Of those students at the CSB who have never taken online classes, what proportion avoided them intentionally and why?
3. What is the overall opinion about on-line classes of those students at the CSB who have taken these classes?
4. What are the opinions of those students who have, and those who have not, taken online classes regarding each of 10 critical factors affecting the overall quality of such classes, and are these two sets of opinions significantly different?
5. What are the advantages and disadvantages of online classes as perceived by those who have, and those who have not, taken such classes?

## METHODOLOGY

To compare student perceptions of online classes as a function of their exposure to such classes, a pencil/paper survey was developed and administered to 148 students in four in-class sections of the required capstone management course at the CSB. This course was selected because

- being a required course, every senior had the opportunity to take this survey, and
- being a capstone course, those students who intended to take online classes had already taken such classes.

The survey appears in Appendix 1. The subjects were given 15 minutes to complete the survey; no extra credit was given for doing so.

Insofar as this research focuses on students' *perceptions*, no objective criteria were pre-defined for them. This explains the use of subjective criteria, such as "better than" and "worse than", in the phrasing of the survey instrument questions, rather than pre-defining for them what constitutes "better than" and "worse than" from the authors' viewpoint.

## Demographics

The demographics of students at the CSB in general are as follows:

- Gender:
  - Female: 49%,
  - Male: 51%
  
- Ethnicity:
  - African American: 6%
  - Asian: 17%
  - Hispanic: 32%
  - Unknown: 8%
  - White: 33%
  - International: 3%

Of the 148 students who participated in this survey,

- 67 (45.3%) had never taken an online class;
- 81 (54.7%) had taken at least one online class.

## Critical Factors of Quality

Ten critical factors (in question form) relating to research question number four were derived from the literature (Wagner, Vanevenhoven & Bronson, 2010; Clark-Ibanez & Scott 2008; Colaric & Taymans, 2004; Schmidt, 2002; Grant & Thornton, 2007) and from internal discussions at the CSB. The latter took place in the Undergraduates Program Committee over a nine-month period. The challenge facing the Committee was to develop criteria that could be used in deciding whether or not to approve proposals submitted by the faculty for online delivery of classes. It became clear early in the process that the conception of such criteria, as well as the language used to express them, tended to be somewhat biased *against* online classes. An effort was made to revise that conception (and the language) so that the resulting criteria would be *equally* applicable to both online and face-to-face classes. Moreover, these discussions helped to define best practices of effective teaching methods and student learning.

The ten critical questions resulting from this process are:

Do on-line classes:

1. Allow students to get help from professors faster?
2. Produce lower quality explanations of the material and answers to student questions?
3. Give students exposure to richer and more diverse learning material allowed by the digital means of delivery?
4. More extensively utilize teaching materials personally created or structured by professors (vs. merely adopting them from external sources, such as textbook publishers)?

5. Make professors play a less active, engaged role in the conduct of the course?
6. Provide students with more opportunities for cheating?
7. Generate more frustration due to exclusive reliance on computer and communications technologies?
8. Allow professors to more effectively demonstrate their passion for the subject matter and get students excited about it?
9. Allow students less opportunity to benefit from their interactions with fellow classmates?
10. Ultimately result in more learning and excelling in the subject matter?

## RESULTS AND INTERPRETATION

The findings in this research are divided into two types:

1. Within Group – involving information characterizing responses *within* each group (exposed, versus unexposed, to online classes), i.e. descriptive statistics.
2. Between Groups – involving information characterizing responses *between* the two groups (exposed, versus unexposed, to online classes), i.e. tests of hypotheses.

### Within Groups Results

#### 1.A. Students exposed to online classes

Number of online classes taken (Question 2):

- Range: 1-5
- Mode: 1
- Median: 2

Overall opinion of online classes (compared to face-to-face classes), on a 1 (online classes are much worse) to 5 (online classes are much better) scale (Question 5):

- Maximum: 5
- Minimum: 1
- Mode: 3
- Median: 3
- Mean: 2.72
- Distribution:  
    “1”: 15%      “2”: 25%      “3”: 38%      “4”: 18%      “5”: 4%

This is a right skewed distribution showing that, on average, students have a lower opinion of online classes than traditional classes.

#### 1.B. Students not exposed to online classes

Motive (Question 3)

- Deliberately avoided online classes: 48%
- Were open to the possibility of taking online classes: 52%

Basis of opinion about online classes (Question 4)

- what they have heard from other students who have taken online classes: 40%
- what they have read about online classes: 4%
- their own beliefs about online classes: 53%
- online classes taken at other universities: 4%

Note that the above percentages do not add up to 100% because the subjects were allowed to check more than one category.

Overall opinion of online classes (compared to face-to-face classes), on a 1 (online classes are much worse) to 5 (online classes are much better) scale (Question 5):

- Maximum: 4
- Minimum: 1
- Mode: 2
- Median: 2
- Mean: 2.31
- Distribution:

“1”: 21%      “2”: 38%      “3”: 37%      “4”: 4%      “5”: 0%

This is likewise, right skewed, and apparently more so than the students who have been exposed. This leads to the first null hypothesis (Hypothesis 0):

H<sub>0</sub>: There is no difference in perception of online classes between students who have been exposed and those who have not.

AH<sub>0</sub> (alternative hypothesis): There is a difference in perception.

## Comparative Results

For each of the ten critical questions listed above, we tested the null hypotheses H<sub>i</sub> and alternate hypotheses AH<sub>i</sub>, where i=1,...,10.

H<sub>i</sub>: There is no difference in perceptions between students exposed to online classes and those who have not been exposed.

AH<sub>i</sub>: There is a difference in perceptions between the two groups of students.

The means of the two groups for each of the hypotheses are included in Table 1. The hypotheses were tested using the Mann-Whitney U Test. There significant differences at the 0.05 level of significance between the two groups on four dimensions leading to the rejection of hypotheses H<sub>0</sub>, H<sub>4</sub>, H<sub>7</sub> and H<sub>9</sub>. In each of these four cases, we accept the alternative hypothesis that there

is a significant difference between the two groups. In other words, the survey indicates the extent to which online classes, compared to face-to-face classes are perceived to:

1. Be overall better (H<sub>0</sub>)
2. More extensively utilize teaching materials personally created or structured by professors (H<sub>4</sub>)
3. Be more frustrating due to exclusive reliance on computer and communications technologies (H<sub>7</sub>)
4. Allow students less opportunity to benefit from their interactions with fellow classmates (H<sub>9</sub>)

In each of the above four dimensions, students who have been exposed to online classes had a *more favorable* impression than those who have not. The last three of these perceptions by non-exposed students could easily be formed on an *ad hoc* basis. In other words, without having experienced an online course, it would seem reasonable to arrive at those conclusions. It is only after taking one or two courses that one could learn that there are techniques for mitigating these perceived problems. For example, students in online courses often have more interactions with their fellow students because one does not have to be physically in class to interact. Discussion boards, chat rooms and other techniques give students a chance to interact without having to recite in class. This is especially true in the case of international students who may be reluctant to interact in class because of language difficulties, but interact more freely online where they can take the time to absorb the discussion and think out their responses.

Survey Question, Hypothesis	Variable	Exposed Students	Non-Exposed Students
5, H <sub>0</sub>	overall opinion of online (compared to face-to-face) classes	2.72	2.31 <sup>a</sup>
<i>Compared to traditional face-to-face classes, online classes ...</i>			
6A, H <sub>1</sub>	Allow students to get help from professors faster	2.64	2.48
6B, H <sub>2</sub>	Produce lower quality explanations of the material and answers to student questions	3.11	3.46
6C, H <sub>3</sub>	Give students exposure to richer and more diverse learning material allowed by the digital means of delivery	3.07	2.79
6D, H <sub>4</sub>	More extensively utilize teaching materials personally created or structured by professors	3.17	2.7 <sup>a</sup>
6E, H <sub>5</sub>	Make professors play a less active, engaged role in the	3.53	3.66

	conduct of the course		
6F, H6	Provide students with more opportunities for cheating	3.19	3.52
6G, H7	Are more frustrating due to exclusive reliance on computer and communications technologies	2.95	3.51 <sup>a</sup>
6H, H8	Allow professors to more effectively demonstrate their passion for the subject matter and get students excited about it	2.3	2.21
6I, H9	Allow students less opportunity to benefit from their interactions with fellow classmates	3.55	3.98 <sup>a</sup>
6J, H10	Ultimately result in more learning and excelling in the subject matter	2.57	2.37
<sup>a</sup> $p \leq .05$			

Technology can always be problematic, but with the rapid expansion of options, both in hardware and communications channels, this soon becomes a moot point with those who have been exposed to online courses. Even simple steps by the instructor such as converting all class materials into pdf documents eliminate most compatibility problems.

For the remaining dimensions, we accept the null hypotheses and conclude that there is no significant difference between the two groups. The data do allow additional insights, if not definitive conclusions. For example, we may note the overall direction of these perceptions. If by “favorable” is meant an average rating of 3 or higher for questions phrased positively (6A, 6C, 6D, 6H, 6J), and an average rating of 3 or lower for questions phrased negatively (6B, 6E, 6F, 6G, 6I), then the data suggest, that the perceptions of two groups (exposed and unexposed) towards online (versus traditional) classes, are as follows:

- $H_0$ : The perceptions of both groups were unfavorable (a statistically significant difference at  $p = .05$ ). (Question 5)
- $H_1$ : The perceptions of both groups were unfavorable regarding the extent to which online classes allow students to get help from professors faster. (Question 6.A.)
- $H_2$ : The perceptions of both groups were unfavorable regarding the quality of the explanations of the material and answers to student questions provided in online classes. (Question 6.B.)
- $H_3$ : The perceptions of both groups were unfavorable regarding the extent to which online classes give students exposure to richer and more diverse learning material allowed by the digital means of delivery. (Question 6.C.)
- $H_4$ : The perception of the exposed group was favorable whereas the perception of the unexposed group was unfavorable (a statistically significant difference at  $p = .05$ ) regarding

the extent to which online classes more extensively utilize teaching materials personally created or structured by professors. (Question 6.D.)

- H<sub>5</sub>: The perceptions of both groups leaned toward the unfavorable regarding the extent to which professors play an active, engaged role in the conduct of online, relative to face-to-face, classes. (Question 6.E.)
- H<sub>6</sub>: The perceptions of both groups leaned towards the unfavorable regarding the extent to which students have opportunities for cheating in online, relative to face-to-face, classes. (Question 6.F.)
- H<sub>7</sub>: The perception of the exposed group was more favorable regarding the extent to which reliance on computer and communications technologies create frustration in online, relative to face-to-face, classes than was the perception of the unexposed group regarding the same issue (a statistically significant difference at  $p = .05$ ). (Question 6.G.)
- H<sub>8</sub>: The perceptions of both groups leaned toward the unfavorable regarding the extent to which online classes allow professors to more effectively demonstrate their passion for the subject matter and get students excited about it. (Question 6.H.)
- H<sub>9</sub>: The perceptions of both groups leaned toward the unfavorable (a statistically significant difference at  $p = .05$ ) regarding the extent to which students have opportunities to benefit from their interactions with fellow classmates in online, relative to face-to-face, classes. (Question 6.I.)
- H<sub>10</sub>: The perceptions of both groups were unfavorable regarding the extent to which online classes ultimately result in more learning and excelling in the subject matter. (Question 6.J)

In addition, using the same definition of ‘favorable’, in all but one of the remaining critical factors, the exposed students had more favorable perception of online courses than non-exposed students. In abbreviated form these are:

- Faster response from professors (H<sub>1</sub>)
- Lower quality explanations (H<sub>2</sub>)
- Richer base of materials (H<sub>3</sub>)
- More personally created materials from the professor (H<sub>4</sub>)
- Professors are less engaged (H<sub>5</sub>)
- More chances to cheat (H<sub>6</sub>)
- Ultimately more learning (H<sub>10</sub>)

Only H<sub>8</sub>, allowing professors to demonstrate their passion more effectively showed neither a statistically significant difference nor any direction from which one may draw conclusions.

## INTERPRETATION AND ANALYSIS

### Question 5

*The perceptions of both groups leaned toward the unfavorable regarding the overall perception of online classes.*

Useful clues as to the reason for this overall unfavorable attitude emerge from the open-ended Questions 7 and 8. While the *only* advantage of online classes was seen by both groups – not surprisingly – to be the flexibility they offer students to study at their own pace at times of their choosing (hence gaining greater control over their lives), there turned out to be a rather long list of perceived disadvantages, viz.,

- the lack of personal face-to-face contact with the professor as well as with other students;
- not appropriate for complex subjects that require personal, repeated explanations;
- little learning takes place;
- easy to fall behind and procrastinate – requires strong self-discipline;
- difficult to communicate with classmates;
- difficult to do group work;
- unable to communicate by nonverbal means; loss of rich communication content;
- lack of office hours;
- easy for students to cheat;
- cannot ask classmates for help;
- difficult to clearly understand professors' expectations;
- hard to get quick response from professor;
- end up learning from the book rather than from the professor;
- no recognition of personal achievement; feeling isolated;
- low expectation by professor of students

The two lists of disadvantages of online classes as perceived by the two student groups (exposed and unexposed) were not significantly different.

### Question 6.A.

*The perceptions of both groups were unfavorable regarding the extent to which online classes allow students to get help from professors faster.*

The keyword is “faster”. This could be interpreted in either of the following ways:

1. Positive interpretation: Professors in traditional face-to-face classes already provide help to students at a (satisfactorily) fast rate, hence online professors cannot provide help any faster.
2. Negative interpretation: Professors in traditional face-to-face classes are slow in providing help to students, and online professors are not any better.

Given the prevalence of e-mail as a means of student-professor communication regardless of teaching mode, the first interpretation seems more credible.

## **Question 6.B.**

*The perceptions of both groups were unfavorable regarding the quality of the explanations of the material and answers to student questions provided in online, relative to traditional face-to-face, classes.*

In the ideal online class, rich communication media (synchronous video, audio) are utilized to communicate with the student body. It remains a reality, however, that the majority of communication in online classes (both from professor to students, as well as among the students) still takes place via e-mail. Media Richness Theory (Newberry, 2001; Daft and Lengel, 1986; Markus, 1994; Ngwenyama and Lee, 1997; Kock, 2005) suggests that lean media (such as e-mail) are not effective in resolving ambiguities and uncertainties. This is a rapidly evolving area with the increasing use of social media such as Facebook in online courses.

## **Question 6.C.**

*The perceptions of both groups were unfavorable regarding the extent to which online classes give students exposure to richer and more diverse learning material allowed by the digital means of delivery.*

Along the lines of Question 6.A., it may be argued that many traditional face-to-face classes already utilize rich and diverse learning material, such as videos (whether watched in class or required to watch outside of class as part of homework). Hence, to infer that online classes employ an equally rich set of learning material is not to make a negative statement.

## **Question 6.D.**

*The perception of the exposed group was favorable whereas the perception of the unexposed group was unfavorable (with this difference being statistically significant at  $p = .05$ ) regarding the extent to which online classes more extensively utilize teaching materials personally created or structured by professors.*

Textbook publishers, in response to the popularity of online classes, have enhanced the richness of their offerings to include easy-to-access, web-based teaching materials that go beyond traditional printed textbooks, such as interactive assignments, videos, and so forth. With teaching material provided and structured for them, many professors may find it unnecessary to develop their own teaching materials. And yet, it is revealing that the overall perception of the exposed group paints a contrary picture.

## **Question 6.E.**

*The perceptions of both groups were unfavorable regarding the extent to which professors play an active, engaged role in the conduct of online, relative to face-to-face, classes.*

This result may be interpreted as a corollary to some of the above items. If professors communicate with students mostly via e-mail and rely heavily on pre-developed material by the publishers, it would seem reasonable that students in their online classes would not perceive them to play an engaged role in the conduct of their classes.

### **Question 6.F.**

*The perceptions of both groups were unfavorable regarding the extent to which students have opportunities for cheating in online, relative to face-to-face, classes.*

This is fairly easy to explain, as it is generally believed that students have a plethora of means at their disposal to cheat in online classes, such as having someone else take the tests and exams for them, saving online test documents and making them available to others (perhaps for quid pro quo), looking up answers to test questions in their textbooks and notes, and so on. In an earlier paper, however, the authors (2010) showed that cheating is no more prevalent in online courses than in traditional courses.

### **Question 6.G.**

*The perception of the exposed group leaned towards the favorable whereas the perception of the unexposed group leaned towards the unfavorable (with this difference being statistically significant at  $p = .05$ ) regarding the extent to which reliance on computer and communications technologies create frustration in online, relative to face-to-face, classes.*

This is a revealing result in that it translates basically into the notion that unexposed students tend to overestimate the technological frustrations associated with taking online classes.

### **Question 6.H.**

*The perceptions of both groups leaned towards the unfavorable regarding the extent to which online classes allow professors to demonstrate more effectively their passion for the subject matter and get students excited about it.*

This can be explained by reference to the Media Richness Theory discussed under Question 6.B. The demonstration of passion and enthusiasm involve non-verbal cues that are difficult to convey using e-mail.

### **Question 6.I.**

*The perceptions of both groups were unfavorable regarding the extent to which students have opportunities to benefit from their interactions with fellow classmates in online, relative to face-to-face, classes.*

This, too, is not difficult to explain, as face-to-face contacts tend to create more committed friendships with sufficiently high affective content to make students willing to support their peers. This can be a delicate trade-off, however, since we noted earlier that often online courses lead to more interaction. The difference is that online the interaction is not face-to-face (which could be better since it eliminates a lot of potential biases).

### **Question 6.J.**

*The perceptions of both groups leaned towards the unfavorable regarding the extent to which online classes ultimately result in more learning and excelling in the subject matter.*

The perceived quality of learning is a complex function of many variables. On the one hand, one can expect that the flexibility inherent in online classes would substantially increase the *quantity* of time devoted to studying. On the other hand, the majority of the questions discussed above fail to point to online classes as a source of distinct communication or pedagogical advantage. It may, therefore, be inferred that the advantages of online classes fail to outweigh its disadvantages enough to result in a perceived overall higher quality of learning.

The other way of looking at this issue is that, at the CSB, most online classes cover the core business curriculum for which there is generally not as much commitment or enthusiasm on the part of students as there is for upper division classes in their major field of study.

## **CONCLUSION**

What emerges from this study is a complex picture of the perceived advantages and disadvantages of online classes relative to traditional, face-to-face classes. Perhaps the most important lesson to be learned is that online classes, while probably the wave of the future, are still not at the point where they are perceived by students taking them to be clearly superior to their traditional counterparts. The specific findings in this study are potentially a key to building effective models of delivery of online classes.

## **FUTURE RESEARCH**

A future direction for research in this area would be one in which the comparison of online and traditional classes would be done less directly. In other words, instead of comparing the two modes of delivery directly along a number of dimensions, it may be informative to have both student groups (exposed and unexposed) evaluate *each mode* independently of the other so as to enable measurements that could paint a picture of the *magnitude* of the perceived difference between them in terms of the comparison dimensions on which this study has focused.

In any event, continuous research is needed in the area of online learning if only because the field is evolving so rapidly. As we mentioned earlier, social media are becoming more important. Communications software such as Skype allows more personalized interactions. A question we alluded to earlier is whether or not on-line interaction has the potential to mitigate

bias based on race, ethnicity, gender or national origin. A related question is whether or not online discussions (which are *not* real-time chat rooms) provide a better learning environment for students studying in a language other than their native language.

Hardware technology is advancing with the spread of smart phones and tablet computers which can access the internet through wi-fi or the mobile phone system, and which can be carried virtually everywhere. The online learning software is evolving rapidly also, with open source software, such as Moodle, becoming important competitors to proprietary software, such as Blackboard. And finally, educational markets are becoming global, increasingly making obsolete the “same location/same time” constraint associated with face-to-face delivery methods.

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## APPENDIX 1. THE SURVEY INSTRUMENT

1. Have you ever taken an online class at the CSB? \_\_\_Yes \_\_\_No

***If “yes”, please continue with question 2; if “no”, skip to question 3.***

2. What is the total number of online classes you have taken at CSB? \_\_\_\_\_

***Please skip to question 5***

3. Have you avoided online classes on purpose?

\_\_\_ Yes. I have not taken, and will not take, any online class deliberately

\_\_\_ No. I am, and have been, open to the possibility of taking online classes

4. What is the source (basis) of your opinion of online classes?

My opinion of online classes is shaped by:

\_\_\_ what I have heard from other students who have taken online classes

\_\_\_ what I have read about online classes

\_\_\_ my own beliefs about online classes

other: \_\_\_\_\_

5. Compared to face-to-face classes, what is your overall opinion of online classes on the following scale:

1 = online classes are much worse than face-to-face classes

2 = online classes are worse than face-to-face classes

3 = I don't have a preference one way or another

4 = online classes are better than face-to-face classes  
5 = online classes are much better than face-to-face classes  
My opinion: \_\_\_\_\_

5. Use the following rating scale to assess your agreement or disagreement with statements A - J appearing below:
- 1 = strongly disagree
  - 2 = somewhat disagree
  - 3 = neither agree nor disagree
  - 4 = somewhat agree
  - 5 = strongly agree

Compared to traditional face-to-face classes, online classes ...

- A. Allow students to get help from professors faster.
  - B. Produce lower quality explanations of the material and answers to student questions.
  - C. Give students exposure to richer and more diverse learning material allowed by the digital means of delivery.
  - D. More extensively utilize teaching materials personally created or structured by professors (vs. merely adopting them from external sources, such as textbook publishers).
  - E. Make professors play a less active, engaged role in the conduct of the course.
  - F. Provide students with more opportunities for cheating.
  - G. Are more frustrating due to exclusive reliance on computer and communications technologies.
  - H. Allow professors to more effectively demonstrate their passion for the subject matter and get students excited about it.
  - I. Allow students less opportunity to benefit from their interactions with fellow classmates.
  - J. Ultimately result in more learning and excelling in the subject matter.
7. In a sentence or two, what is the most important **advantage** of online classes?
8. In a sentence or two, what is the most important **disadvantage** of online classes?

About the authors

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