

**ONLINE TEACHING AND CLASSROOM CHANGE:
THE IMPACT OF VIRTUAL HIGH SCHOOL
ON ITS TEACHERS AND THEIR SCHOOLS**

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INTRODUCTION

Online and face-to-face (face-to-face) courses are often seen, and studied, as two separate worlds. In the past, most of these studies have been comparative—Is an online course in such-and-such subject more or less effective than a face-to-face course in the same subject?—although increasingly the focus is on evaluating each in its own terms (Sener 2005, Lockee et al. 1999). This is progress, but it still considers the two environments separately. Yet while face-to-face and online courses do indeed take place in separate environments, the social field of the teacher who teaches them includes both. And as this teacher moves—either simultaneously or serially—from one environment to the other, the course being taught will also go through several transformations as it is shaped and reshaped to fit first one and then the other.

It is these transformations—of the teacher and of the course—and the two-way interactions, or flow, between face-to-face teaching and online teaching, that are the focus of this study. Much as immigrants leave the cultural comfort of their home societies and move to places with very different cultures and social practices, those who teach online leave the familiarity of the face-to-face classroom for the uncharted terrain of the online environment, which has constraints and affordances that lead to very different practices. Face-to-face classrooms are closed environments—a teacher and his/her students together in one room for 50 or so minutes a day—and online classrooms are no different. What is different is that the teacher now moves between the two, transferring ideas, strategies, and practices from one to the other. This “trans-classroom” teacher is a mental, rather than a physical, migrant.²

This paper will look at the full migration path, as a course (and teacher) move from face-to-face to online and then back to face-to-face. The setting is the Virtual High School, so we begin there.

² The metaphor of the migrant comes from some of the recent literature on migration theory. Migrants who maintain contact with their home societies, either by physically returning for visits, or by sending and receiving visitors, remittances, and information, operate in a social field that migration theorists call “transnationalism.” In a recent article, two of these researchers make a distinction between transnational ways of being and transnational ways of belonging that is suggestive for the classroom context as well: “Those who engage in social relations and practices that cross borders as a regular feature of everyday life ... exhibit a transnational way of being. When people explicitly recognize this and highlight the transnational elements of who they are, then they are also expressing a transnational way of belonging. Clearly, these two experiences do not always go hand in hand.” (See Levitt and Glick Schiller 2004: 4.)

THE SETTING: VIRTUAL HIGH SCHOOL

Virtual High School was chosen as the locus of the study in part because of its long history of offering successful online courses in many subject areas and in many different schools across the United States, but also because almost all VHS faculty members also teach face-to-face courses in their own schools and because VHS requires all its teachers to take a professional development course on the pedagogy of teaching online. Founded in 1996 with funding from a five-year U.S. Dept. of Education Technology Innovation Challenge Grant, VHS is the oldest U.S. provider of distance learning courses--called NetCourses by VHS--to high school students. VHS operates with a collaborative exchange model whereby each teacher of an online course receives 25 seats in other VHS courses for students from his/her school. As a result, almost all VHS teachers have one foot in the face-to-face classroom at the same time as they have the other foot in the online classroom; very few only teach online. (For details of VHS's structure and history, see Pape, Adams, and Ribeiro 2005; and Zucker et al., 2003.) In addition, VHS courses, although asynchronous, are not self-paced. These are online courses that take place in online classrooms: students follow a weekly syllabus, work on group or team projects with other students, interact with their fellow students through the discussion forums, and "talk" informally at the Water Cooler.³ In 2003-2004, VHS offered 169 unique courses in 195 course sections, taught by 176 teachers, and enrolled approximately 2,500 students a semester. Over the years, students have come from over 300 schools in 27 U.S. states, as well as 24 international schools. VHS offers both core and enrichment courses in all disciplines and at all levels (from Basic Writing to AP Physics). The maximum enrollment is 25, and the average class size is 17.

VHS courses are highly rated: VHS's online design and delivery standards were the model used by the National Education Association in its recommended standards for online learning, and VHS was a winner of the American School Board Journal's Magna 2000 Award for exemplary use of technology in education (<http://www.govhs.org>; Pape, Adams, and Ribiero 2005). All VHS courses meet NCAA accreditation standards. In addition, VHS's evaluations have shown that VHS courses are as successful as face-to-face courses in terms of quality of content and student achievement (Zucker et al. 2003).

³ VHS began with Lotus Notes as the course management system but moved to BlackBoard in 2004.

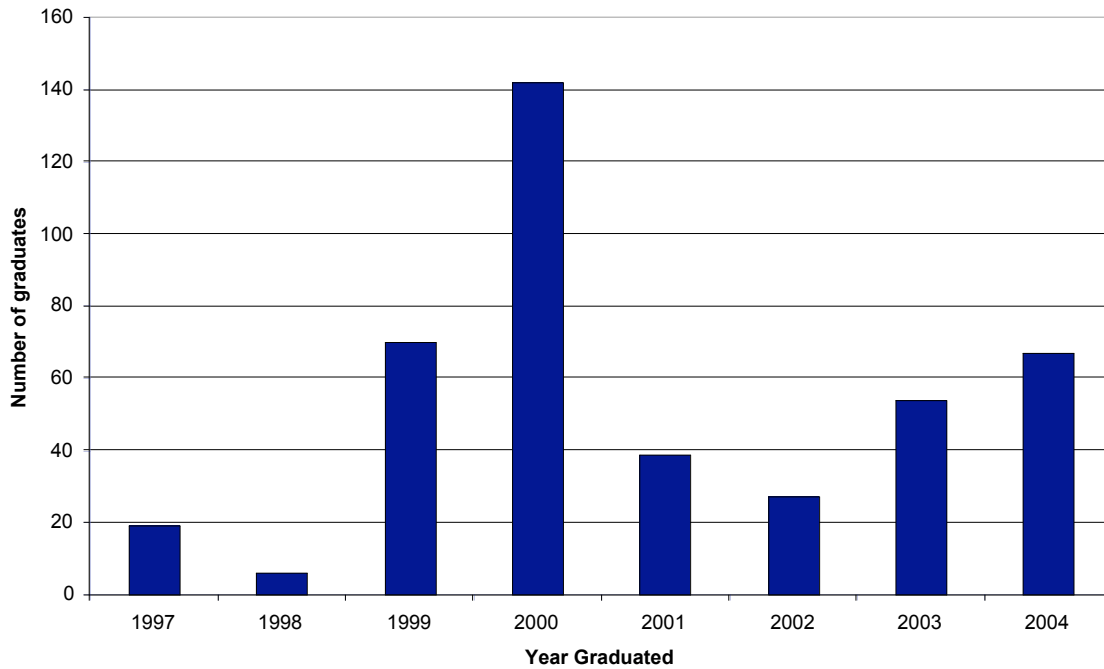
VHS Pedagogy and Professional Development

In its first few years, VHS quickly realized that to assure quality courses, it needed to provide systematic and easily accessible training for its teachers. The result was two online professional development courses: the Teachers Learning Conference (TLC), a 22-week online course for those who want to design and build a new VHS course while learning online collaborative learning and course moderation techniques; and NetCourse Instructional Methodologies (NIM), a 15-week online course that provides an opportunity for teachers to learn online pedagogy and methodology while training to teach an existing VHS course. Both courses are stringent and demanding in terms of time: teachers who participate in TLC are expected to spend between 15 and 20 hours per week on coursework and earn 12 graduate credits; those who take NIM are expected to spend between 10 and 15 hours a week and earn 6 graduate credits.

There is a growing body of literature on the characteristics of successful online courses and on how to bring good pedagogy to the online environment, and VHS's courses show teachers how to apply this knowledge to the online courses they will be teaching (Haavind 2000; Haavind and Rose et al. 2002; Hsi 1999; McIntyre and Elbaum 2000; Pape, Adams, and Ribiero 2005). VHS's pedagogical approach emphasizes student-centered teaching; collaborative, problem-based learning; small-group work; and authentic performance-based assessment. Its courses are developed using Grant Wiggins and Jay McTighe's "backward design" approach (Wiggins and McTighe 1998). This type of pedagogy is more familiar to elementary and middle-school teachers than to high school teachers, so for many teachers, TLC and NIM are their first introduction to this approach to teaching.

All new VHS teachers are required to take one of the two courses, and between 1997 and 2004, 424 teachers did so. New VHS teachers are also mentored (and supervised) by experienced VHS teachers during their first semester teaching online. The chart below shows that the number going through the TLC and NIM peaked in the last two years of the Technology Innovation Challenge grant (1999-2000)—when access was still free—and dropped when the grant ended and a new pricing model was instituted. They have been rising since:

VHS Professional Development Course Graduation Numbers by Year



THE RESEARCH METHODOLOGY

This research began with a series of interviews six current and former VHS teachers in order to better understand some of the issues surrounding creating and teaching online courses. These interviews took the teachers through the entire circle: from teaching a face-to-face course, to developing and then teaching an online course, and then (where applicable) to teaching face-to-face. They elicited a long and complex list of the kinds of changes these teachers had made in adapting their face-to-face courses for the online environment, in teaching their online courses over several semesters, and in their subsequent face-to-face teaching. These interviews became the basis for an online survey (see Appendix) that was developed and sent, via email, to the 459 VHS teachers for whom we had email addresses (of a total of 464). This list included 229 who were no longer teaching through VHS, 47 who were not yet teaching--either because they were in training or had only recently completed training--and 188 who were active as of late 2004.⁴

⁴ A link to an online version of the survey was sent in an email from the researcher, preceded by an email from VHS. The survey had "skip logic," so that teachers moved through different pages depending on how they answered certain questions. For instance, a teacher who created a new course had slightly different questions from one who taught a course created by someone else. Similarly, a teacher who developed an online course but had not yet taught it did not see the many questions about the (subsequent) experience of teaching in the face-to-face classroom.

A total of 215 teachers, or 46 percent of the population, responded, including 63 percent of those currently teaching.⁵ Not surprisingly, those currently teaching were overrepresented, compared to the entire population, while those no longer teaching were underrepresented:⁶

Survey respondents compared to the VHS population

	VHS population		Survey respondents	
	Frequency	Percent	Frequency	Percent
Currently teaching	188	41%	136	63%
No longer teaching	229	49%	59	27%
Not yet teaching	47	10%	20	10%
	464	100%	215	100%

Nevertheless, the respondents were fairly representative of the range of TLC and NIM graduation dates, with the earlier years only slightly underrepresented. This is important because those who began to teach online earlier are more likely to have had subsequent experiences teaching face-to-face:

Survey respondents compared to the VHS population for TLC/NIM Graduation Year

Graduation year	VHS population	Survey respondents
1997	4%	3%
1998	1%	1%
1999	15%	11%
2000	31%	25%
2001	8%	4%
2002	6%	9%
2003	12%	13%
2004	14%	26%
2005	9%	9%
	100%	100%

⁵ Astonishingly, only 3 bounced back, an indicator of the extent to which VHS keeps in touch with its teachers, including those who are no longer teaching. In addition, I received a number of cheery personal emails from respondents, telling me that they had submitted the survey or had tried but needed help with firewalls—plus a few who took me to task for the wording of some of the survey questions. Responses are still drifting in, but cut-off date for the dataset was May 31, 2005.

⁶ Although more teachers from recent TLC and NIM courses are currently teaching VHS courses than TLC/NIM graduates from previous years, between 15 and 20 percent of those who took these courses in the first three years were still teaching in 2004. In many cases, it was not that the teacher wanted to stop teaching online but that the school withdrew from the consortium, generally for financial reasons (Pape, Adams, and Ribiero 2005: 130).

The respondents were also fairly representative of the entire VHS population in terms of subject areas taught, with a concentration in the Social Sciences (including history and economics), Science, and English Language Arts. This is important because we wanted to examine whether the transfer from online to face-to-face would be easier in some subject areas than others:

Survey respondents compared to the VHS population for subject area⁷

	VHS population		Survey respondents	
	Frequency	Percent	Frequency	Percent
Social Sciences	86	23%	35	19%
Science	83	22%	41	22%
ELA	79	21%	46	25%
Computer Science/Programming	35	9%	20	11%
Math	35	9%	11	6%
Arts/Art History	29	8%	15	8%
Other	23	6%	11	6%
Foreign Language	9	2%	6	3%
Total	379	100%	185	100%
Not specified/missing	85		30	

For their first courses, equal numbers (108 versus 108) had developed courses (and had thus taken the TLC training) as had adapted existing VHS courses (and had taken the NIM training). It was important to have a good representation of both to be able to analyze whether one group was more likely than the other to make changes in their face-to-face classroom practice:

For you first VHS course, did you ...

	Frequency	Percent
Adapt an existing VHS course	107	50%
Develop a course never taught	70	33%
Adapt a course currently teaching face-to-face	22	10%
Adapt a course had taught face-to-face in past	16	7%
Total	215	100%

⁷ These figures come from our classification of VHS data (not from the survey, which did not ask this question). VHS's lists did not include the course(s) taught all teachers, which is why there are 85 "unspecified." If a teacher taught more than one course, we categorized by the first course. The "Other" category included such subjects as Consumer Affairs and Careers.

CREATING THE ONLINE COURSE

Creating and then teaching an online course can be a transforming experience for teachers. Here is how one VHS teacher described it toward the end of the online training:

By developing my course, I have had the opportunity to introspectively analyze what I am teaching, why I teach the way I do, and how I can change and improve my communication with students. (Quoted in Pape, Adams, and Ribiero 2005: 125)

This is true for teachers who are creating a new course—one they have never taught in a face-to-face classroom--but it is particularly true for those who are adapting a course that they have taught face-to-face, because doing this forces them to reexamine the course's organization, content, and pedagogy.

As noted above, the TLC and NIM are rigorous courses that teachers must take as they create (for the TLC) or adapt (for the NIM) courses for teaching online. Both emphasize the type of constructivist curriculum design more familiar in face-to-face than in online teacher preparation, and in elementary and middle schools than in high schools. The survey therefore asked teachers how familiar they had been with the various components of this kind of curriculum before they took the TLC or NIM courses. Almost all said they were very familiar with those components that are often abstracted and implemented separately (i.e., cooperative learning, rubrics), and over 80 percent also said they were familiar with problem-based learning and authentic assessment.⁸ However, fewer were familiar with backward design, which often involves rethinking an entire approach:

Question: How familiar were you with the following before you taught through VHS?

	Not at all/little	Moderate	A lot/very	Total
Backward design	41%	23%	36%	100%
Authentic assessment	17%	19%	63%	100%
Problem-based learning (PBL)	12%	21%	67%	100%
Use of rubrics in assessment	6%	12%	83%	100%
Cooperative learning	4%	12%	84%	100%

⁸ The choices were on a Likert scale of 1 (Not at all) to 5 (Very). These were collapsed for purposes of analysis. Note that we did not ask if they were implementing these, only if they were familiar with them.

By the end of the courses, the percentage who considered themselves very familiar with these components of curriculum design had increased in all categories, with the greater increases in those areas where less had been known before:

Question: How familiar do you feel you are with these concepts now?

	Not at all/little	Moderate	A lot/very	Total	Increase
Backward design	16%	10%	74%	100%	38%
Authentic assessment	6%	8%	86%	100%	23%
Problem-based Learning (PBL)	6%	10%	85%	100%	17%
Use of rubrics in assessment	1%	2%	97%	100%	15%
Cooperative learning	2%	3%	95%	100%	11%

Although those who convert existing courses, or design new ones, might be considered most likely to reflect on their own practices, those who sign up to teach existing VHS courses are encouraged to adapt them to fit their own knowledge base and teaching styles. Many reported that they not only made significant changes, but that they continued to do so in subsequent iterations, as they deepened their ownership of the course:⁹

Percent who changed a course each time it was taught

	Extensively	Moderately	Very little	Not at all	Total
First time	23%	33%	35%	8%	100%
Second time	5%	53%	40%	2%	100%
Third time	5%	49%	44%	3%	100%
After the third time	0%	57%	37%	7%	100%

Those who adapt existing face-to-face courses for the online environment need to decide what to keep, what to add, what to substitute, and what to take out. The following table shows highlights in bold the most prevalent choice for each type of adaptation. For instance, 86 percent of respondents made changes in their online readings, and 78 percent of these were additions.¹⁰ On the other hand, 60 percent made changes in their use of quizzes, but more took them out than added or

⁹ This table shows percentages. Note that the actual numbers in each iteration decline because fewer teachers have taught a course multiple times. First time n = 96; second time n = 62, third time = 39; and more than three n = 30.

¹⁰ In response to a question about the difficulties of creating a course, some of the teachers wrote about the struggle to find resources to replace or supplement the textbook that were at the right reading level, but also noted how this was compensated by the benefits of having immediate access to up-to-date information.

substituted. Similarly, assignments using PowerPoint and other digital media, written assignments, and rubrics were more likely to be added, while lectures, worksheets, and textbook readings were more likely to be taken out.

All these changes were in line with the course design standard emphasized in the TLC and NIM courses. The same is true for the more fundamental curriculum components—whole-class discussions, group projects or assignments, peer reviews, and debates. The largest type of change in each category is highlighted in boldface; the curriculum-related changes are boldfaced in the left-hand column. The column “Made changes” is a total of the three different possible changes:

Changes made in converting face-to-face course to online

	Made changes	Added	Substituted	Took out	Remained the same	Total
Online (Internet) readings/resources	86%	78%	8%	0%	14%	100%
Lectures	78%	19%	25%	33%	22%	100%
Other print readings/resources	72%	28%	19%	25%	28%	100%
Whole-class discussions	67%	36%	25%	6%	33%	100%
Group projects/assignments	64%	31%	28%	6%	36%	100%
Multimedia assignments (i.e., combining text and images)	63%	43%	20%	0%	37%	100%
Quizzes	60%	14%	20%	26%	40%	100%
Peer reviews	58%	47%	11%	0%	42%	100%
Debates	57%	31%	14%	11%	43%	100%
Worksheets	57%	9%	14%	34%	43%	100%
Textbook readings	54%	6%	20%	29%	46%	100%
Written assignments	54%	37%	17%	0%	46%	100%
Rubrics	53%	29%	24%	0%	47%	100%
Assignments using PowerPoint or webpages	49%	29%	20%	0%	51%	100%

The same pattern holds true for those who adapted courses developed by others, although these teachers were somewhat less likely to make changes overall. In addition, they did more adding than substituting—and, as would be expected by

those who are adapting an existing course, more substituting than simply removing as they took ownership of the course:

Changes made in adapting existing online course

	Made changes	Added	Substituted	Took out	Remained the same	Total
Online (Internet) readings/resources	72%	40%	33%	0%	28%	100%
Whole-class discussions	64%	39%	22%	2%	36%	100%
Group projects/assignments	64%	32%	21%	10%	36%	100%
Written assignments	61%	33%	28%	0%	39%	100%
Rubrics	58%	37%	20%	1%	42%	100%
Quizzes	45%	18%	18%	9%	55%	100%
Other print readings/resources	44%	20%	20%	3%	56%	100%
Peer reviews	39%	27%	11%	1%	61%	100%
Multimedia assignments (i.e., combining text and images)	38%	30%	7%	1%	62%	100%
Assignments using PowerPoint or webpages	32%	20%	10%	2%	68%	100%
Lectures	31%	14%	13%	3%	69%	100%
Textbook readings	29%	13%	12%	3%	71%	100%
Worksheets	23%	7%	10%	6%	77%	100%
Debates	20%	12%	7%	1%	80%	100%

Those who created entirely new courses were less likely to include some of the activities that others had taken out, such as worksheets and textbooks readings—81 percent said they did not include worksheets in their online courses, while 55 percent said they did not include textbook readings. And 78 percent said they did not include lectures. In addition, almost all included group projects and whole-class discussions, while over half included peer reviews:

Activities included by those creating a new course

Written assignments	94%
Online (Internet) readings/resources	91%
Group projects/assignments	89%
Whole-class discussions	81%

Other print readings/resources	63%
Quizzes	61%
Multimedia assignments (i.e., combining text and images)	61%
Rubrics	55%
Peer reviews	55%
Assignments using PowerPoint or webpages	47%
Textbook readings	45%
Debates	33%
Lectures	22%
Worksheets	19%

While these data show the kinds of changes made by those creating online courses, and are thus one indication of the effect the TLC and NIM courses have on reshaping curriculum and pedagogy, it must be remembered that those who reported no change often did so because they included these activities already. Thus in describing their online courses, almost all the respondents reported that they had their students complete multi-week projects and work collaboratively in groups at least occasionally, while over 80 percent had their students do peer reviews and almost 70 percent had their students create multimedia assignments:¹¹

How often did you do the following in your online course?

	At least occasionally	Never
Have students complete multi-week projects	98%	2%
Have students work collaboratively in groups	95%	5%
Have students do peer reviews	84%	16%
Have students create multi-media assignments	69%	31%

In addition, the discussion forums are not only central to VHS courses but posting is generally a requirement. Thus all the survey respondents reported that they required the students to use the discussion forums and most said they required it every week. However, some went beyond the VHS requirements: almost two-thirds (65%) said they also used email with students and quite a large number (43%) used chat—with

¹¹ The choices here were Every Week, Every few weeks, Occasionally, Never. Most of these would not be done every week, so the three choices (i.e., all except Never) were combined for purposes of analysis.

their own Instant Messaging (IM) clients, since VHS does not at this time support chat on BlackBoard.

In sum, then, no teacher took a face-to-face course and simply ported it wholesale to the online environment. Instead, they re-examined their course design, re-considered their curriculum strategies, and made many decisions about what to take out and what to keep, what to add and what to substitute. Whether they were already using the kinds of pedagogies advocated by VHS or learned them in the TLC and NIM courses, their finished courses looked very different from the courses they had been teaching face-to-face.

TEACHING THE ONLINE COURSE

While creating an online course is challenging, it is actually *teaching* the course that leads teachers to re-examine some of the fundamental differences between the two classroom cultures. In the online environment, a whole host of issues—including teacher-student and student-student communication, the extent and nature of reflection, student accountability, and assessment--are very different from the face-to-face classroom.

In response to an open-ended question about the major issues they faced in teaching online, some teachers wrote about the time demands involved in monitoring and responding to discussions forums, answering email, and grading student assignments, and the frustrations of dealing with a new and frequently cranky technology. But many more wrote about how they struggled to make their courses effective learning experiences. The thread running through all these responses was how to reach, and evaluate, students when you cannot interact with them face-to-face on a daily basis.

In terms of reaching students, some—particularly women—were very conscious of how they relied on their personalities in their teaching, and had trouble envisioning how they could teach without this personal connection:¹²

¹² These fears are also apparent in the survey VHS gives to teachers before they actually take either professional development course. For example, one NIM teacher wrote that he/she was concerned about the lack of face-to-face contact because "I am a people person." Another wrote that he/she was "very good at reading my audience and it is a new challenge to work without facial expression, tone, and body language..." and still another wrote that he/she was concerned about not having body language, which is

- _ “[One of my greatest challenges was] lack of use of body language as a tool to help determine student understanding and as a means of explanation.”
- _ “I had all of the materials and curriculum, but how was I going to adapt the information into a meaningful course on line? How was I going to make my personality come alive to my students?”
- _ “[One of my greatest challenges was] figuring out how to convey my enthusiasm and how to make the course more than just text on a page. I also felt more conscious of the connotations of my words. In the online environment there are no vocal inflections to send auditory clues as to how a comment is to be understood. I did not want to sacrifice humor and word play nor did I want to offend unintentionally.”
- _ “[One of my greatest challenges was] getting a feel for the ability of the students strictly from written work.”

Others raised different issues of teacher-student communication: how to provide instructions that were clear enough, and sufficiently explicit, so that students would be able to complete them:

- _ “I had to make sure my directions were extremely clear because I couldn't repeat myself or rephrase my question if a student 'looked' confused.”
- _ “[One of my greatest challenges was] the extent to which I needed to describe or provide information. Since students could not ask questions and get an immediate response, I needed to make sure I was clear as well as anticipant potential questions.”
- _ “[One of my greatest challenges was] making the written materials clear, and not forgetting things that are easy to assume.”
- _ “I had to learn how to communicate in a completely online environment and make sure that I was understood.”
- _ “[One of my greatest challenges was] anticipating where instructions, directions, or procedures may need examples to help students visualize expectations.”
- _ “[One of my greatest challenges was] making the instructions foolproof.”
- _ “[One of my greatest challenges was] communicating abstract mathematical concepts in only a written format.”

“so expressive and helpful to me in face-to-face situations.” VHS talks about how teachers have to find their “voice” online (Pape, Adams, and Ribiero 2005: 125). It should be noted that some teachers, including a few of those who responded to the survey, find that face-to-face interaction is an essential component of their teaching and quickly leave the online classroom.

- _ "I needed to find more than one way of asking a question. I often did this by asking several questions instead of only one."
- _ "In the classroom, it is easier to see where the kids interest takes us. You can read their enthusiasm on their faces and know where to take them next."
- _ "Another challenge was to clarify the definitions of complex concepts without the student questions that prompt the clarification."

This was a particular concern for those whose face-to-face course had a hands-on aspect:

- _ "[One of my greatest challenges was] how to do labs without face-to-face instruction; how to keep kids at the same place and interacting with each other." (A science teacher)
- _ "[One of my greatest challenges was] taking a topic which was largely experiential and making it alive in the online environment." (A science teacher)
- _ "Since I teach drama by performance mainly, my face-to-face students are up on their feet and speaking. Obviously this doesn't work for an online course. The challenge was keeping drama alive for students who would be reading on their own." (An English Language Arts teacher)

In addition, in face-to-face classrooms, teachers know if their students are confused (by their questions or by the looks on their faces), but in online courses this type of just-in-time assessment has to be done through text. Many teachers struggled with this:

- _ "[One of my greatest challenges was] not seeing the facial expressions on the kids (this is very valuable to gauge understanding and collect general information about their attitudes and veracity) and not having a good way to determine whether they were doing their own work."
- _ "It's harder to be sure where the students are in their understanding when you can't see their faces when you ask a question."
- _ "I missed verbal and nonverbal cues a teacher takes for granted to assess student understanding."

Others commented on the fact that distance emphasized the students' need for constant reassurance, and the burden that this put on them to respond to posts, including private posts, immediately:

- “[One of my greatest challenges was] interacting with students worldwide when they needed immediate feedback.”

On the other hand, one pointed out the other side of this coin:

- “Although it was time-consuming, I was able to have much closer supervision of the groups online because I would see them all, and could go to them privately if I needed to.”

Still others were concerned about making sure that all students participated in the discussions, and that student-student communications, particularly in the discussion forums, were meaningful learning experiences:¹³

- “[One of my greatest challenges was] making the course more than a correspondence course - how to have students feel a part of a class environment.”
- “[One of my greatest challenges was] developing discussions that were worthwhile and added to student learning.”
- “The difference in class discussion was the hardest thing for me to adapt to, bridging the gap caused by lack of facial expression and vocal inflection.”
- “I had to develop questions that required higher order thinking skills to be used and had to encourage and guide students through the discussion process until they became more comfortable with expressing their opinions, defending their research, etc.”
- “I had to create questions that would generate discussions that would probe deeper understanding, that push the students to explain and thus improve their understanding.”

¹³ It should be noted that when asked to compare the quality of student discussions in face-to-face and online courses, many students and teachers see online discussions as less effective than face-to-face discussions. I have found this in my own study of an online International Baccalaureate economics course for high school juniors and seniors, while Jonathon Margolin, researching VHS's Online AP Academy, reported that 45 percent of the teachers responding to his Fall 2004 survey also felt this way (while 43 percent felt the opposite). However, during this project, I began to think that this may be the result of calling what are really very different experiences by the same name. In other words, some teachers and students do not see the posts in a Discussion Forum as real “discussions,” instead confining the term to the faster back-and-forth of face-to-face interactions, but value each for its different characteristics. The way most survey questions are worded (including mine), as either/or choices, is a legacy of the “comparison trap” noted above. This is an area that I think would benefit from further research.

Some were concerned with the loss of flexibility in course organization when you had to plan the entire course ahead of time (a VHS requirement) and could not adapt on a just-in-time basis to the student population. This concern surfaced in their descriptions of how they struggled with how to pace the course, how to break it into manageable pieces, how to provide scaffolding, and how to organize groups:

- _ "It was difficult to know how fast a student would work online versus face to face. Workload and assignments were challenging because I didn't know what I could expect from students that were online."
- _ "[One of my greatest challenges was] determining the appropriate amount of work required each week."
- _ "[One of my greatest challenges was] determining how much text was too much, how much assignment was sufficient and not overwhelming"
- _ "I had to focus on what was essential—I had to figure out the most essential problems, the most important problems; and I had to think through the scaffolding very carefully."
- _ "The time lag between posts and responses makes group work difficult."

This is a particularly vexing issue for online teachers whose courses build on a series of sequential assignments, so that falling behind in one assignment leads the entire carefully constructed sequence to collapse.

Still others were concerned about how to assess if their online students had learned what they wanted them to learn.

- _ "[One of my greatest challenges was] creating assignments that truly reflected student learning/understanding."
- _ "It was challenging designing the assessment for the course since it is difficult to measure ability level, effort, etc."

In another example, a math teacher had to restructure his assignments to take into account the fact that his students would have no problem finding the answers on the Internet, then working out a solution to fit; another had to be aware of student writing styles to make sure it was in their own words, not grabbed from Internet sites.

In summary, it was teaching the online course, rather than creating it, that led these teachers to develop ways to communicate with students they could not see, to find ways to know if they were meeting their needs, and to assess whether, and what, they had learned.

THE TRANS-CLASSROOM TEACHER: TEACHING FACE-TO-FACE AFTER TEACHING ONLINE

The combination of the VHS professional development course, along with the constraints and opportunities afforded by the online environment, leads to the transformation of a face-to-face course in terms of both content and pedagogy. The question then becomes how, and to what extent, does this affect the teacher, and how, and to what extent, is this transformation subsequently transported back into the face-to-face environment.

While, as noted earlier, there is now considerable literature on the characteristics of successful online courses and on how to bring good pedagogy to the online learning environment, there is little research on the effect of teaching online on the teachers who teach there and none at all on the effect on the face-to-face classroom. There are, however, hints about this effect scattered in various reports. For instance, SRI, which evaluated the original Technology Innovation Challenge Grant for VHS, asked one question whose responses suggested the possibilities:

Aside from using new technological skills in regular classrooms, teachers indicated that they were using new teaching or assessment approaches in their other courses (year 2, 61%; year 1, 55%). Both principals (62%) and superintendents (68%) also said that teachers used new teaching and assessment approaches in other courses. (Espinoza et al. 1999: 35)

Another glimpse is provided by the responses to the end-of-year survey that VHS sends to all its currently active teachers. In 2004, 79 percent of these teachers agreed that they had transferred some of what they had learned while teaching online back to the classroom:

**Question: I have used some of the pedagogy
I've learned through VHS in my face-to-face classes**

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
38%	41%	17%	3%	1%

Other evidence is more anecdotal: for instance, VHS has frequently heard reports from teachers about how strategies learned and applied in their online courses have influenced both their face-to-face teaching and their relationships with their students.

A total of 158 of the 215 respondents, or 74 percent, reported that they had taught face-to-face classes either while they were teaching online or subsequently. Almost 75 percent of these reported that teaching online had a positive impact on their face-to-face teaching:

Question: Overall, do you feel that teaching online had a positive impact on your face-to-face teaching?

	Frequency	Percent
Very much	57	36.1
Somewhat	61	38.6
Neutral	21	13.3
Not very much	15	9.5
Not at all	4	2.5
Total	158	100.0

It is important to note that over two-thirds of these teach different courses in each environment. In other words, many apparently see teaching online as an opportunity to expand their teaching, not repeat it:

Do you also teach face-to-face?

	Percent
Yes, but different courses	69%
Yes, similar courses	19%
Yes, the same courses	11%
Total	100%

What Changed?

Although we had a general idea, from the above reports and from the interviews, that teachers did make changes when they went back to the face-to-face classroom, we wanted to learn exactly what they changed. Some changes—for instance, using

lessons, assignments, assessments, and rubrics that had worked online—seemed relatively easy and therefore likely. Others, such as assigning more Internet resources/activities and adding peer reviews, seemed likely because they were the two items that had been most frequently added (as opposed to substituted) when teachers were creating their online courses. On the other hand, those changes that had been part of the TLC and NIM training but require fundamental rethinking—using backward design principles in creating curriculum, changing fundamental classroom practices (i.e., introducing PBL, cooperative learning, group work)--seemed more difficult. In addition, we were interested in whether some of the issues relating to the need for explicitness and clarity in teaching online, as well as the role of discussion and written reflection, were carried back into the face-to-face classroom.

The survey therefore asked respondents to choose from a long list of possible changes, and to rate the amount of change for each on a Likert scale that ranged from 1 (No Changes) to 5 (Major Changes). There were a total of 40 choices, which were grouped into six areas:

Course design/redesign

- Eliminated lessons that now seemed poorly designed
- Redesigned lessons using Backward Design principles
- Designed new lessons using Backward Design principles
- Added lessons/units that had been successful in online course

Course organization

- Did more advance planning
- Used class time more efficiently
- Changed how groups were organized
- Broke projects into smaller pieces (chunking)
- Provided additional scaffolding for large projects

Communication (teacher-to-student, student-to-student)

- Made instructions clearer/more explicit
- Made key concepts clearer/more explicit
- Provided more detailed instructions
- Provided more written instructions
- Provided additional for students to communicate with me (i.e., email, chat)
- Used an online discussion forum in my classes
- Provided more timely feedback
- Required class contributions from all students
- Found ways to give students more time to formulate answers
- Found additional ways to monitor individual students

Assignments/assessments

- Added written assignments

- Made written assignments longer
- Added communication projects (i.e., student-to-student, student-to-expert, via email or videoconferencing)
- Added multi-media assignments
- Added peer reviews
- Added online tests/quizzes
- Reduced use of tests/quizzes
- Added new rubrics
- Refined existing rubrics
- Readings/resources
 - Added more Internet resources
 - Assigned more Internet research
 - Assigned more Internet-based activities (i.e., web-based simulations, WebQuests)
 - Assigned more current-events resources
 - Assigned more real-time data sources (i.e., for science)
 - Reduced reliance on textbook
 - Added use of online survey tools
- Multimedia (as teacher and with students)
 - Used PowerPoint more often in teaching
 - Developed website(s) for my course(s)
 - Encouraged PowerPoint presentations from students
 - Encouraged web pages from students
 - Encouraged other multimedia assignments (i.e., combining images and text)

The first table below lists, in order, the six items for which at least 60 percent of the teachers reported making at least some changes.¹⁴ As seemed likely, “Added peer reviews” was the change made by the largest number of respondents, and eliminating lessons that now seemed poorly designed and/or adding lessons that had been effective online are also there. In addition, however, two of the items involve major changes, both relating to integrating backward design principles into the face-to-face classroom:¹⁵

Changes reported by at least 60 percent of respondents

Assignments/assessment	Added peer reviews	69%
Course design/redesign	Eliminated lessons that now seemed poorly designed	67%
Course design/redesign	Redesigned lessons using Backward Design principles	66%

¹⁴ The choices were on a 5-point Likert scale, ranging from “No changes” (1) to “Some changes” (3) to “Major changes” (5). Although a choice of 2 indicates a little bit of change, we have chosen to be conservative and combine choices 3 through 5 into the category “At least some.”

¹⁵ It must be stressed again that the survey asked teachers to report change, and that—as noted earlier—some of those who reported No change did so because they were already doing these things. It is because of this that we cannot draw any conclusions about those who reported that they did not change but instead focus on those who reported that they did.

Course design/redesign	Designed new lessons using Backward Design principles	66%
Communication	Provided more detailed instructions	65%
Course design/redesign	Added lessons/units from online course	60%

When we look at the items for which between 40 percent and 60 percent of respondents reported making at least some changes, the transfer of strategies learned from teaching online predominates:

Changes reported by between 40 and 60 percent of respondents

Course organization	Changed how groups were organized	58%
Communication	Required class contributions from all students	57%
Communication	Provided more timely feedback	57%
Course organization	Did more advance planning	56%
Communication	Provided more written instructions	55%
Assignments/assessments	Broke projects into smaller pieces (chunking)	52%
Assignments/assessments	Made written assignments longer	52%
Communication	Used an online discussion forum in my class	50%
Communication	Provided additional ways of communication with students (i.e., email, chat)	46%
Multimedia	Added multi-media assignments	46%
Communication	Found ways to give students time to formulate answers	46%
Course organization	Used class time more efficiently	45%
Assignments/assessments	Reduced use of tests/quizzes	44%
Assignments/assessments	Added written assignments	44%
Course organization	Provided additional scaffolding for large projects	44%
Assignments/assessments	Added new rubrics	44%
Assignments/assessments	Added online tests/quizzes	43%
Readings/resources	Assigned more Internet research	42%
Communication	Made instructions clearer/more explicit	41%
Readings/resources	Added more Internet resources	41%
Communication	Made key concepts clearer/more explicit	41%

Finally, when we look at those items for which under 40 percent of teachers reported making at least some changes, we can see that most are items where fewer teachers *can* make changes. In other words, there are some—particularly those relating to the

use of technology--that either many teachers cannot adopt, while there are others—such as PowerPoint presentations—that any one teacher would, in the best of circumstances, only do occasionally:

Changes reported by less than 40 percent of respondents

Communication (with students)	Found additional ways to monitor individual students	38%
Readings/resources	Added communication projects (student-to-student, student-to-expert, via email or videoconferencing)	38%
Evaluation	Refined existing rubrics	35%
Readings/resources	Assigned more Internet-based activities (i.e., web-based simulations, WebQuests)	34%
Readings/resources	Assigned more current-events-related resources	30%
Multimedia	Developed website(s) for my course(s)	30%
Multimedia	Used PowerPoint more often in teaching	29%
Readings/resources	Reduced reliance on textbook	26%
Readings/resources	Added use of online survey tools	23%
Multimedia	Encouraged other multimedia assignments (i.e., combining images and text)	22%
Multimedia	Encouraged PowerPoint presentations from students	22%
Multimedia	Encouraged web pages from students	19%
Readings/resources	Assigned more real-time data sources (i.e., for science)	16%

In a series of open-ended questions, respondents were asked to expand on four areas of change that had seemed, from the interviews, to be those where the constraints and affordances of the online environment are particularly salient: class participation, independent learning, questioning techniques, and metacognition (reflection). Although these were described as optional questions (and were at the end of a long survey), between 80 and 85 percent (depending on the question) of the 158 who had taught face-to-face after teaching online responded. About half described the changes they had made, often including the techniques or strategies they had brought from the online classroom into the face-to-face classroom; the other half reported that they were either (1) already doing whatever it was successfully; (2) did not believe that it *should* be done; or (3) had not yet done it but would like to.¹⁶ These were the questions:

¹⁶ An example of (1) was a comment like: "Was doing this already." An example of (2) was a comment like: "I have not done this and I am not sure I ever would." Examples of (3) are "No, but it is something I would like to do" and "Not really, still working on it ☺."

- _ Class participation: Have you been able to translate the participation that can be mandated in an online classroom (for instance, by requiring all students to contribute to a Discussion Forum) back to the classroom? If so, how did you accomplish this?
- _ Independent learning: Have you been able to translate the independent learning/responsibility for own learning/independence of your online students back into the classroom? If so, how did you accomplish this?
- _ Questioning techniques: Have your facilitation or questioning techniques changed as a result of your experience teaching online? If so, how did they change and what effect do you think this has had on your students?
- _ Metacognition/reflection: Have you been able to translate the time for thought/reflection that is one outcome of the asynchronous nature of the online classroom back to the face-to-face classroom? If so, how did you accomplish this?

Class participation

In online classes, full participation in discussions can be mandated by requiring a certain number of posts a week, or by requiring that students respond to each other's posts. The teacher can easily monitor the quantity and quality of the participation, including who is participating, when, and how often. This is more difficult in a face-to-face classroom, and is a particularly knotty issue when it comes to group work and collaborative projects.

Some respondents wrote about the techniques they use for guaranteeing equal participation, sometimes drawing parallels to the online classroom. For instance, one wrote that she had students draw Popsicle sticks, which was "like seeing each name in a thread." Some did not think it was possible, or even desirable, or was too difficult in the face-to-face classroom:

- _ "Some students who will speak up on a discussion forum online will still, for a variety of reasons, not contribute in a class discussion. I do not force students to participate in class. This is unfair to students who are shy."
- _ "Not fully, on a day-to-day basis it is difficult to require full participation. In an online class, students have a full week to complete their participation because of the asynchronous time. In a face-to-face classroom, that would be more difficult (not impossible) to incorporate."

- _ "This is harder to do in the limited amount of time with face-to-face classes."

For others, however, teaching online had raised their awareness of the issue of participation and led them to devise ways of encouraging it:

- _ "Somehow, having discussions with students online to some extent minus huge elements of personality, as sometimes happens face-to-face, has helped me in expecting quality responses from all students, not just those 'eager' responders. So I have tried harder to make sure all students have a chance to be included."
- _ "I am more aware of who is participating and who is not. I try to make more eye contact with those not as willing to participate, and to call on them to encourage them to participate more."
- _ "I give a participation grade to my FACE-TO-FACE students now where I didn't before on-line teaching."
- _ "If anything, the online class requirements reinforced the understanding that all students need to participate in some way."
- _ "I am more aware now and insistent upon students participating in discussions. I use a seating chart and place dots beside students that have responded."
- _ "Yes, I require that my students are more actively engaged in my face-to-face."
- _ "I haven't changed much since I've always required participation, but I do keep track of that more religiously ..."

Two described how they had used group projects to encourage fuller participation:

- _ "My students participate more frequently now in small group discussions where they must share their expertise. An example is literature circles, where each student in the small group is an expert in a different piece of literature but all members focus on the same question, such as the way authors reveal theme."
- _ "Absolutely. More smaller group work. Use teams with leader (coordinator) responsible for communicating with me. Bring groups together to share successes and difficulties."

And some did this directly, by importing the online discussion forum into their face-to-face classroom:

- _ "Yes, I accomplished this by creating a Blackboard supplement for my face-to-face classes and requiring participation."
- _ "I have incorporated online discussions into my classroom using LiveJournal.com."
- _ "I have one class where we actually do participate in an asynchronous discussion. I have one computer set up with the discussion posted, and students read the discussion requirements and make their posts. Students have responded well to this. I am trying to figure out how I can incorporate this type of discussion into more of my classes."

Others said they had thought about how to make changes but had not done so yet:

- _ "No, I haven't [made changes]. It's an interesting idea and has already caused me to think about that possibility. Since I am an integral part of the discussion, it's hard for me to keep track of who talks and who doesn't."
- _ "No, but I thought about how nice it would be to require an whole class discussion that students could process at their own speed and reflect thoroughly on each others responses. I am just not aware of a medium to do this right now on our system at school."

Independent learning

To be successful in online courses, students need to be self-motivated, well-organized, and independent learners, but at the same time, taking online courses can help students to develop these characteristics.¹⁷ In addition, students cannot rely on their charm (or parents' intervention) to negotiate over late assignments or poor work--a particular issue in affluent schools. In response to a question asking them to compare their face-to-face and online students, 43 percent of the respondents felt their online students were better organized than their face-to-face students and 42 percent felt they worked harder.

¹⁷ This research does not address the question of which students make successful online learners or the kinds of support needed to make this happen. Some of the survey respondents noted that it is often the best students who take online courses. However, not all students do succeed online. It seems more likely if students are operating in a supervised and structured setting. For instance, VHS has trained site coordinators and advises that its schools require in-school seat time for all its VHS students.

As with class participation, some of the respondents struggled with fostering independent learning in the face-to-face classroom:

- _ "I find in a traditional classroom this is perhaps the hardest part. Students tend to waste class time if given liberty to work alone or unsupervised. Students in VHS have a rigid schedule, strict guidelines, and a more one-on-one relationship with their computer."
- _ "I find my face-to-face students still whine a lot and I eventually enable them."

But for others, teaching online had led to a subtle but potentially far-reaching shift in their attitude toward their face-to-face students:

- _ "I took a stronger stand on independent learning and had higher expectations for my face-to-face students than I did before."
- _ "I assume kids can get info on their own now, where before, I didn't. I felt like I needed to spoon feed them. Students who struggle doing that are identified early, and in most cases it is not a learning issue but one of discipline, organization and/or motivation. A meeting with parents to develop a plan for learning has been very helpful with these students."
- _ "Yes, I require that my face-to-face students work more independently and often use exemplars from my online class in my face-to-face. I find I give instructions and examples and then allow the students to work more independently."
- _ "I think I've come to trust that kids can do more than I usually realize and that probably influences the way I design our learning time."

For some, this was linked to a shift in pedagogy in the face-to-face classroom:

- _ "Yes. I now let students pick research topics and explore them. I step back and let them take control of their learning. I act more on the side instead of in charge of their learning."
- _ "I incorporated more project based learning where students are responsible for the quality and completion of the project by a deadline."
- _ "Yes - used some of the independent exercises developed for the on-line class into FACE-TO-FACE."
- _ "Yes, for the traditional courses I have been encouraging the active learner and student-centered environment more so than before."

- _ "I like the technique of weekly assignments and then students having the responsibility to budget/manage their time accordingly. When possible I do this in my face-to-face classes."
- _ "Yes. Lately I give out weekly packets which include homework assignments, notes, video questions, Lab outlines. In the front I have all the assignments listed. Students are required to make sure all assignments are completed. Recently I added a checkbox and points that are associated with each lesson. I plan on including more and more as the year progresses."
- _ "I have given more assignments that require individual research, written questions, and independent research than I did before."
- _ "I have set up assignments that I began in my online classes to work in the conventional classroom... Instead of lecturing on the historical and cultural context of the story, they find it on their own."

Questioning techniques

To work well, online discussion forums need thoughtful facilitation, including careful attention to how questions are asked. Respondents wrote about what they had learned about how to ask questions that they had imported into their face-to-face classrooms:

- _ "I learned online that my questions have to be very clear and free of ambiguity. We can always improve in this area. My students are getting better questions now."
- _ "I try to be much clearer about what I'm asking and then allow time for the students to process what I asking."
- _ "I think I have been able to ask direct questions or focus students on the topics more easily ... so they have less misunderstanding about concepts."
- _ "I am much more detailed in my questions to make sure my students don't get confused. I also am better at asking follow up questions to get my students to dive deeper into the content and to think critically."
- _ "As for questioning techniques, this is something I am constantly struggling with. I am working at asking more in-depth meaningful questions in my classes, but it is difficult for me to do. I think my skills have improved. My students are beginning to use higher level thinking skills a little more often, and are willing to give me more than a yes or no, or two or three word answer."

- _ "I no longer accept short oral responses from my students."

Some wrote about how they were now more confident using open-ended questions in their face-to-face classrooms, and less likely to provide answers:

- _ "More open ended questioning occurs in my face-to-face classes now as a result of online courses. It has encouraged my students to be more open and willing to answer in responses and not just one word answers."
- _ "My questioning techniques have become more along the line of reflection instead of just repeating back the factual information. Much more class time is devoted to critiquing situations and writing responses to events rather than to relating what the events were."
- _ "I believe that I now ask more open-ended questions and I am more content to allow the students to search for their own responses instead of providing them with mine. I am more relaxed about the need to 'cover' a great deal of material, believing instead that it's important to balance depth and coverage."
- _ "I have started to ask more open ended questions, allowing students to figure out more answers than I give them."
- _ "I have been more aware of the extension questions that are asked online. I do spend more time with these types of questions in my face-to-face classes."

Others linked this to larger changes in pedagogical approach in their face-to-face classrooms, and particularly to a reduction in the amount of time spent lecturing and a shift to role as facilitator:

- _ "I think that I assume kids can get info on their own more now than before on-line teaching. I now do much more formative assessment by questioning and having students demonstrate knowledge rather than give out knowledge. I don't lecture much at all now, and when I do, it is usually to clarify things student have had to dig out on their own."
- _ "I use more student-centered teaching so I become the facilitator. [Gives example of group project] I then provided a group and individual grade, but included significantly their evaluations of specific stages and their final evaluations of self and peer. I had earlier taught research and required individual papers. This time, students told me they really understood the process."
- _ "Yes, I provide question to groups rather than just individuals."

- _ "I am more willing to act as a facilitator after teaching online. I am more willing to try not to control every aspect of the classroom. Students generally respond well when they have choices. ... Without my online teaching experience, I don't think I would have been as willing to try a layered curriculum approach."
- _ "I have begun breaking assignments down into smaller chunks. I used to assign short answer analyses to poems and passages from the reading. I have added a step to the assignment where they first isolate passages and specific words from those passages that make the points they are trying to defend. There was no reason I could not do this before I began teaching online, it is just as a result of teaching online I started thinking in terms of smaller bits."

Metacognition/reflection

Another affordance of the online environment is the time for thought or reflection that is a result of the asynchronous nature of the discussion forum. Although posts can certainly be off-the-cuff, in general the fact that they are written, and often graded, forces students to think before they write. In addition, well-constructed questions can lead to reflective answers.

Most of those who reported changes in this area wrote about building more time for reflection into assignments, particularly writing assignments, in their face-to-face classrooms:

- _ "I allow more opportunities for students to reflect on their work and give me private assessments of the class/their own progress, i.e., private threads. Often it is as simple as asking students to put something they like on one side of a file card, and something to be improved on the other side."
- _ "More use of journals and reflective portfolios; this is something I knew I should do more of anyway but VHS has pushed this issue with me."
- _ "Yes, after every unit I have the class do a reflection writing piece."
- _ "I now require all students to respond in writing to a daily 'exit question' related to the day's work. My awareness of the role of reflection in learning has definitely increased since I began teaching my online course."
- _ "Tickets Out the Door concept...TODs...Students will summarize the day's activities in a TOD before they leave the classroom each day. This is very

- similar to a daily posting activity. Also, it allows me to evaluate student understanding.”
- _ “Yes ... essentially I just cut out some of the busy work ... worksheets, needless vocab and writing assignments ... and made the assignments we do more meaningful and require more reflective thought.”
 - _ “Assigning thought questions for overnight/longer consideration. Giving free writing time in class. Giving a list of questions at the beginning of a unit, then asking questions off the list on the test.”
 - _ “The discussions online also have the added benefit of a person going back and responding later. I now add this to my seminars by allowing students to return to a previous question if they have taken notes during a seminar.”

A few wrote about building in more time for reflection in oral discussions:

- _ “I am more aware of reflection time when asking questions within my face-to-face courses.”
- _ “I value the wait time more and have the students work in groups more than before.”

Who Changed?

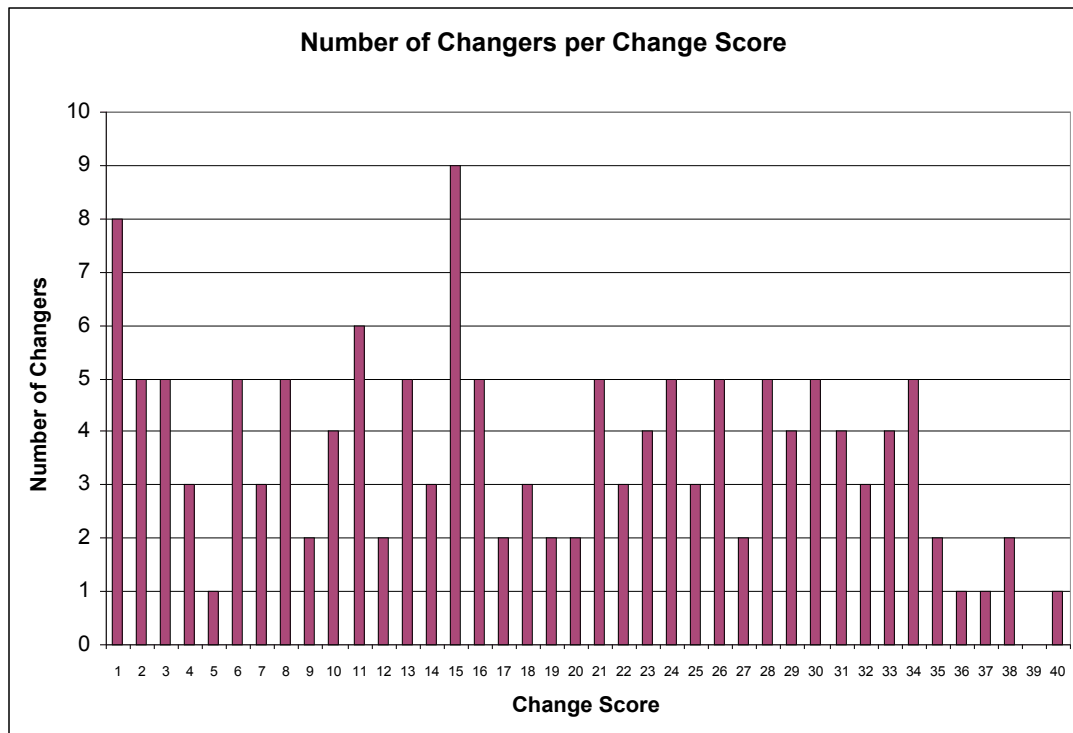
At the beginning of this paper, we described the teacher who moves back and forth between the face-to-face and online classroom, importing ideas and strategies from one into the other, as a trans-classroom teacher, akin to the transnational migrant who lives simultaneously, or serially, in two environments, each of which both enables and constrains activity in different ways but which together form a social field or what Pierre Bourdieu has called a “space of possibilities.” While the previous section showed the kinds of changes made by all the teachers, it did not show the extent of the changes made by any one teacher. Did the respondents make only one change in one area, in which case it seems a stretch to call them trans-classroom teachers, or did they make many changes in many areas--or something in between?

To determine this, we looked at each of the 40 variables listed earlier and gave a score of 1 to those who marked 3, 4, or 5 on the Likert scale--which, it will be remembered, ranged from 1 (No Change) to 5 (Major Changes).¹⁸ The 1’s were then

¹⁸ Although those who chose 2 on the Likert scale indicated by doing so that they had made at least a few changes, we again wanted to be conservative and focus on those who had made at least a moderate amount of change. In addition, it must be remembered, as noted above, that those who said they made

totalled for each respondent, giving a "change score." Individual change scores could therefore range from 40 (made at least some changes in all of the variables) to 1 (made at least some changes in only one of the variables).

A total of 144 people had change scores and were called Changers.¹⁹ Their change scores were spread over the entire spectrum, with a smaller percent making the most changes: 38 percent had change scores from 1 to 13, 37 percent had change scores from 14 to 27, and 26 percent had change scores from 28 to 40:



In order to see if there were any differences between those made many changes and those who made fewer changes, we then split the Changers into two groups. The Minor Changers were those whose change scores were between 1 and 20 and the Major Changers were those whose change scores were between 21 and 40.

It seemed likely that the degree of change might vary by the nature of the subject being taught, and to a small extent this does seem to be the case: those teaching

no changes may already have been doing whatever the question asked. This is therefore absolutely not a measure of what goes on in classrooms, but of the amount of change made by those who made changes.

¹⁹ Sixteen scored 0: in other words, they did not choose 3, 4, or 5 for any of the variables. They are excluded from the analysis that follows.

Math, Science, Social Science, and Foreign Language reporting reported making the most changes, while those teaching Computer Science/Programming and Arts/Art History reported making the fewest. Language Arts was in the middle. This may be because both Art and Computer Science are taught very differently online and face-to-face. What is interesting, however, is that more Math and Foreign Language teachers reported making changes than English Language Arts teachers. This might be because they had more changes to make:

Major and minor changers by subject area

	Minor changers	Major changers	Total
TOTAL	49%	51%	100%
Math	38%	63%	100%
Science	38%	62%	100%
Foreign Language	40%	60%	100%
Social Sciences	44%	56%	100%
ELA	54%	46%	100%
Arts/Art History	57%	43%	100%
Computer Science/Programming	75%	25%	100%
Other	33%	67%	100%

Major Changers were also more likely to have developed online courses than to have adapted existing VHS courses:

Major and minor changers by type of VHS course developed

	Minor changers	Major changers	Total
TOTAL	56%	44%	100%
Adapt own course or develop new course	50%	50%	100%
Adapt existing VHS course	62%	38%	100%

Major Changers were more likely to have graduated in 2000 (the year VHS TLC/NIM registration peaked) or before, perhaps because it takes time to integrate changes but also because they were more likely to have developed courses than adapted them:

Major and minor changers by year of TLC/NIM graduation

	Minor changers	Major changers	Total
TOTAL	56%	44%	100%
1997-2000	49%	51%	100%
2001-2004	60%	40%	100%

And finally, the other factor that seems to make a difference in degree of change is the similarity between the face-to-face and the online courses: those who had made the fewest changes were those who were teaching the same courses online as they taught in the face-to-face classroom, while those who had made the most changes were teaching similar courses. This may be because it is more difficult to change time-tested classroom practices than to bring practices to new courses:

Major and minor changers by type of course taught face-to-face

	Minor changers	Major changers	Total
TOTAL	56%	44%	100%
Yes, the same courses	65%	35%	100%
Yes, similar courses	50%	50%	100%
Yes, but different courses	56%	44%	100%

EFFECT ON THE SCHOOL

In addition to the effects of teaching online on individual teachers, we were interested in exploring whether having teachers who taught both online and face-to-face had an effect on the school. There was also a hint as to this effect in the VHS evaluation report cited earlier:

... Other benefits of the VHS program that superintendents mentioned in comments were that the program helped the whole school make use of technology and made a difference in how the school was perceived. (Espinoza et al. 1999: 35)

On the survey, teachers were asked if they had seen positive changes in their schools, either from the teacher or student perspective, as a result of their teaching online. Of the 132 teachers who responded to this question, 86 said Yes, while 46 said No or were unclear in their assessments.

Between 1997 and 2004, VHS teachers came from 327 individual schools,²⁰ with 27 schools having three or more teachers who had taught through VHS (not necessarily simultaneously, however):

Number of VHS teachers per school

Number of teachers	Number of schools
1	256
2	44
3	18
4	5
5	4
Total	327

We had expected that schools that had more VHS teachers would show greater effects, but this was not corroborated by the survey responses: while some of the teachers in the schools with three or more VHS teachers did write about school-wide effects, others did not—some even said they did not see any effects. And on the other hand, those who did discuss school-wide effects also came from schools with only one VHS teacher.

We also interviewed 4 principals of schools that had had either 4 or 5 VHS teachers over the years. Without exception, these principals felt that the most positive benefit of offering online courses was that it increased the choice of courses available to their students—and thus increased the school’s appeal to students and their parents—and that having the entire VHS roster of courses available gave them much greater flexibility in scheduling.²¹ This was echoed by the teachers, 33 of whom wrote that the most positive change was that it expanded the range of courses they could offer students, as well as giving them the opportunity to experiment with the online environment. This was particularly true of small schools:

- “Since our school is small (400 students in grades 8-12), and therefore has a small faculty, we can't offer many elective courses in-house. VHS allows us to offer a much wider assortment of courses to our students.”

²⁰ This does not include the 8 teachers from one district (Chesterfield County) in a undetermined number of schools, or the 25 teachers who worked directly for VHS.

²¹ It is probably because the principals are responsible for scheduling, and thus see the whole picture, that they are more likely to consider VHS “thoroughly integrated into school life”—as one principal put it—while the teachers see the benefits from a different perspective.

- _ "Virtual High School has transformed our school from a small, poor, school with few class offerings into a small, poor, school with a wide variety of class offerings."
- _ "Students are excited to try courses they would not be able to take otherwise and to stretch themselves and try new things."
- _ "Because I teach a course on-line, this allows students at my school to take on-line courses. This has resulted in a whole new way of learning for students at my school."

Some linked this to the opportunity to interact with students from other places:

- _ "[Our students] have had an opportunity to take electives that our school would never have been able to offer. They have also had an opportunity to interact with a much more diversified collection of students than they typically do face-to-face."²²

Although when VHS began offering courses, many principals were attracted to the opportunity because they believed it provided technology skills to both teachers and students. This is no longer the case: none of the principals and few of the teachers stressed the role of technology as such, but instead talked about providing students with the opportunity to experience an online course before they went on to college.

In addition, both teachers and principals stressed the effect on students of having to work independently and take responsibility for their own work:

- _ "I think the students that I have in my online class do learn to be more independent learners and the students at my school who participated well (got involved in the classes and did the work) became more independent learners as well."

²² One survey question asked teachers if their online courses capitalized on having students in different physical locations. Many did, and gave examples. This aspect of online courses is worth more research. In addition, in the VHS 2004 end-of-year teacher survey, 83 percent of teachers reported that taking an online course gave their students a sense of community among their students:

My students have a greater sense of community with students from other regions because of their VHS classes.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	34%	49%	16%	1%	0%

- _ “The students who did VHS successfully from our school had a magnificent learning experience. They were challenged in ways that our school does not challenge. They learned to communicate and write better. They learned to be responsible for producing quality work.”
- _ “Yes, I have a cadre of students that feel like they are more mature and more responsible for their own learning. They feel more academically capable.”
- _ “There are many positive changes for the students, as we have many taking VHS courses. They learn to work independently and are proud of their work.”
- _ “[My students] also do generally pick a spirit of responsibility for their own learning that I, and most of my colleagues, have not been able to instill.”

One teacher summed it up thus:

- _ “My students in my on-line course typically exceed my expectations and produce some wonderful results that are often able to be shared in the public media or in the community at large. This shows off their talents, and they love it. It also is great for the school's reputation in the community ... But I think the most important thing is that students learn how to learn on their own, and they feel ready to take on-line courses in college or in the work force.”

In terms of positive impact on the entire school, the principals talked about the importance of demonstrating to the school community—including other teachers and parents--that online courses were as academically strong as face-to-face courses. They also had examples of how individual teachers had changed their classroom practices as a result of teaching online, and discussed how online courses set standards that then raised the standards of the face-to-face classroom. But the most potentially far-reaching changes were those where VHS practices or requirements had been imported back into the school. For instance, one principal described how the entire district now requires the kind of curriculum planning that is required in the TLC/NIM courses, while another talked about encouraging more reflection in all classes, including through the use of online discussion forums. Teachers also wrote about changes that had spread to other teachers in the school:

- _ “I added ideas to our School Improvement Team from talking to other NIM students online.”

- _ "The other teachers incorporate more of the online process and backwards planning."
- _ "I think I have been able to be an advocate for change because of what I have learned. Other teachers are giving layered curriculum a try, and as a staff we brainstorm ways of making students more accountable."

CONCLUSION

At the beginning of this paper, we suggested that teachers who move between the face-to-face and the online classroom, transferring ideas, strategies, and practices from one to the other, can be thought of as "trans-classroom" teachers, akin to the transnational migrants who move back and forth between the countries where they are born and the countries they migrate to. Using the Virtual High School as the setting, we followed the migration route of the teacher who creates or adapts, and then teaches, an online course, and then teaches again in the face-to-face classroom. We looked at what changed, who changed, and how much changed, and heard the teachers describe, in their own words, the kinds of changes they had made. We also heard both teachers and principals talk about the broader effects of having access to online courses on their schools.

Although it seems clear from this study that teaching in an online classroom can have a positive effect on teaching in a face-to-face classroom, these results are suggestive, not definitive, and raise a number of questions for future research:

The first question is central to a better understanding of what an online classroom is and how it works. How much change can be attributed to the constraints and affordances of the online classroom and how much to other factors? To teach effectively in an online classroom, teachers must respond to the constraints of distance and asynchronicity by being exceptionally clear and explicit in their instructions, by finding ways to encourage and monitor full class participation, and by using good questioning techniques. On the other hand, they need not, but can, respond to the affordances of that same distance and asynchronicity by increasing opportunities for independent learning, as well as for metacognition and reflection. Do these constraints and affordances apply to all types of online classrooms or only to some? If only some, which are the and what are the factors involved?

This leads directly to the next question. This research was not framed as a study of the effect of professional development on teaching, either online or face-to-face, but it suggests that professional development for online teaching may also have an effect on classroom teaching. For any one teacher, the face-to-face and online classrooms are not two separate worlds but one social space. VHS puts great emphasis on preparing teachers to teach online, and has a professional development model that takes the principles of constructivist pedagogy from the face-to-face classroom and adapts them to the online classroom. How much of these teachers' self-reflection and change is due to this professional development experience? Would we see the same effects with other professional development models? Or is it not the professional development model at all, but the characteristics of the individual teacher, that are key: for instance, online teachers may be teachers with higher levels of professional engagement (Becker and Riel 2000), teachers who are open to new experiences, and who are constantly reflecting on, and changing, their courses and their teaching.

And finally, VHS has a classroom, rather than a course, model. VHS teachers teach a group of students who follow a weekly syllabus as a class, who communicate with each other about their assignments, work together on group projects, and in general operate virtually much as they would in a face-to-face classroom. This is very different from the more self-paced courses that are offered in many virtual schools. Would we see the same effects with teachers who teach more self-paced online courses?

This research also suggests that, from a program point of view, it would be worthwhile exploring ways to proactively capitalize on the fact that online teachers make changes in their face-to-face classroom practice. Can we, and should we, find ways to develop more trans-classroom teachers, or to make nascent trans-classroom teachers more so--for instance, by encouraging more online teachers to reflect on the changes they make when teaching online? Can we, and should we, find ways to encourage the transfer of the more successful aspects of online pedagogy back to the face-to-face classroom? It seems clear from the teacher and principal responses that online teachers are not sharing what they have learned to the extent that they could be—in fact, that they may not even be aware of how much they have learned

and changed. We should consider treating online teachers as resources for their face-to-face classroom counterparts.

BIBLIOGRAPHY

- Espinoza, Carlos et al. "An Evaluation of the Virtual High School after Two Years of Operation." Xerox Park, CA: SRIInternational, November 1999.
- Haavind, Sarah. "Why Don't Face-to-Face Teaching Strategies Work in the Virtual Classroom." *The Concord Consortium* 4, no. 3 (Fall 2000).
- Haavind, Sarah and Rose, Raymond, et al. "Online Courses that Work...and Some that Don't." *The Concord Consortium* 6, no. 1 (Winter 2002).
- Hsi, Sherry. "Fostering Effective Instruction in a Virtual High School: A Netcourse for Teachers." Paper presented at the 1999 meetings of the AERA. Online at <http://www.concord.org/~sherry/papers/aera99/tlc/HsiAERA99tlc.html>
- McIntyre, Cynthia and Elbaum, Connie. "Ten Things You Need to Know." *The Concord Consortium* 4, no. 3 (Fall 2000).
- Levitt, Peggy and Glick Schiller, Nina. "Conceptualizing Simultaneity: A Transnational Social Field Perspective on Society." *International Migration Review* (Fall 2004): 4. Online at: http://www.findarticles.com/p/articles/mi_qa3668/is_200410/ai_n9471690/
- Lockee, Barbara, Burton, John, and Cross, Lawrence. "No Comparison: Distance Education Finds a New Use for 'No Significant Difference'." *Educational Technology Research and Development* 47, no. 3 (1999).
- Margolin, Jonathan and Shapiro, Susan. "Online AP Academy Cohort 1 Update." Naperville, ILL: Learning Point Associates, October 2004.
- Pape, Liz, Adams, Ruth, and Ribeiro, Carol. "The Virtual High School: Collaboration and Online Professional Development." In Zane L. Berge and Tom Clark, eds., *Virtual Schools: Planning for Success*. New York: Teachers College Press, 2005.
- Sener, John. "Escaping the Comparison Trap: Evaluating Online Learning in Its Own Terms." *Innovate: Journal of Online Education* 1, no. 2 (December 2004-January 2005).
- Wiggins, Grant and McTighe, Jay. *Understanding by Design*. Arlington, VA: Association for Supervision and Curriculum Development, 1998.
- Zucker, Andrew et al. *The Virtual High School: Teaching Generation V*. New York: Teachers College Press, 2003.

APPENDIX: SURVEY

The survey, which was originally online, has been reformatted in Word. Note that the online version has skip logic, so that the respondents are directed to different sections of the survey, depending on their answers to certain questions.

TEACHING ONLINE AND IN THE FACE-TO-FACE CLASSROOM

This survey is part of a research project to learn about the changes teachers make when they move from the face-to-face (face-to-face) to the online classroom, and then about the effects of teaching online on teaching face-to-face.

It should take approximately 10 minutes.

As long as you are on your own computer, you do not have to complete the survey in one session. You will be returned to the point where you left off.

At the end, you have the option of checking a box if you would like to receive results of this study when it is completed.

1. Your name
2. Your school
3. For your first VHS course, did you...
 - Adapt a course that you were currently teaching face-to-face (face-to-face)
 - Adapt a course that you had taught face-to-face in the past (but were not currently teaching)
 - Develop a course that you had never taught face-to-face
 - Adapt an existing VHS course

TEACHING ONLINE AND IN THE FACE-TO-FACE CLASSROOM

IF YOU ADAPTED A FACE-TO-FACE COURSE

These questions are for those who adapted a course they were currently teaching face-to-face, or had taught face-to-face in the past. If you have done this more than once, refer to your most recent experience.

1. For each area below, select the choice that most closely reflects the adaptations you made.

	Added	Substituted	Took out	Remained the same
Textbook readings				
Other print readings/resources				
Online (Internet) readings/resources				
Lectures				
Whole-class discussions				
Debates				
Peer reviews				
Group projects/assignments				
Written assignments				
Worksheets				
Quizzes				
Multi-media assignments (i.e., combining text and images)				
Assignments using PowerPoint or webpages				
Rubrics				

2. What were the major challenges you faced in moving the course from a face-to-face to an online environment?
3. What did you learn from the Teachers Learning Conference (TLC) course that you incorporated into the online version of your course?
4. On a scale of 1 to 5, how familiar were you with the following before you took the TLC course?
(1) Not at all (5) Very
 - Problem-based learning
 - Cooperative learning
 - Backward design
 - Authentic assessment
 - Use of rubrics in assessment

5. On a scale of 1 to 5, how familiar do you feel you are with these concepts now?
(1) Not at all (5) Very
 - Problem-based learning
 - Cooperative learning
 - Backward design

Authentic assessment
Use of rubrics in assessment

6. Are you currently enrolled in the TLC or NIM course?

Yes
No

IF YOU CREATED A NEW COURSE

These questions are for those who created a new course, one that they had not previously taught in a face-to-face classroom. If you have done this more than once, refer to your most recent experience.

1. What were the major challenges you faced in creating this course for the online environment?

2. Which of the following did you include? [Check all that apply]

Textbook readings
Other print readings/resources
Online (Internet) readings/resources
Lectures
Whole-class discussions
Debates
Peer reviews
Group projects/assignments
Written assignments
Worksheets
Quizzes
Multi-media assignments (i.e., combining text and images)
Assignments using PowerPoint or web pages
Rubrics
Other (please specify)

3. What did you learn from the Teachers Learning Conference (TLC) course that you incorporated into your course?

4. On a scale of 1 to 5, how familiar were you with the following before you took the TLC course?

(1) Not at all (5) Very

Problem-based learning
Cooperative learning
Backward design
Authentic assessment
Use of rubrics in assessment

5. On a scale of 1 to 5, how familiar do you feel you are with these concepts now?

(1) Not at all (5) Very

Problem-based learning
Cooperative learning
Backward design
Authentic assessment
Use of rubrics in assessment

6. Are you currently enrolled in the TLC or NIM course?

Yes
No

IF YOU TAUGHT AN EXISTING VHS COURSE

These questions are for those who adapted and taught an existing VHS course. If you have done this more than once, refer to your most recent experience.

1. How much did you change the course?

Extensively Moderately Very little Not at all N/A

The first time you taught it
The second time you taught it
The third time you taught it
After the third time

2. For each area below, select the choice that most closely reflects the adaptations you made.

Added Substituted Took out Remained the same

- Textbook readings
- Other print readings/resources
- Online (Internet) readings/resources
- Lectures
- Whole-class discussions
- Debates
- Peer reviews
- Group projects/assignments
- Written assignments
- Worksheets
- Quizzes
- Multi-media assignments (i.e., combining text and images)
- Assignments using PowerPoint or web pages
- Rubrics

3. What were the major challenges you faced in teaching a course created by someone else?

4. What did you learn from the NIM course that you incorporated into the course you were teaching?

5. On a scale of 1 to 5, how familiar were you with the following before you taught through VHS?

(1) Not at all

(5) Very

- Problem-based learning
- Cooperative learning
- Backward design
- Authentic assessment
- Use of rubrics in assessment

6. On a scale of 1 to 5, how familiar do you feel you are with these concepts now?

(1) Not at all

(5) Very

- Problem-based learning
- Cooperative learning
- Backward design
- Authentic assessment
- Use of rubrics in assessment

7. Are you currently enrolled in the TLC or NIM course?

- Yes
- No

TEACHING ONLINE

These questions ask about your experience teaching an online course. If you have done this more than once, refer to your most recent experience.

1. In your online course, did you...

Every week Every few weeks Occasionally Never

- Require students to use the Discussion Forums
- Have students work collaboratively in groups
- Use the Team area (in Blackboard)
- Have students do peer reviews
- Have students complete multi-week projects
- Have students create multi-media assignments
- Use email with your students
- Use chat with your students

2. How did you integrate the Discussion Forums into your curriculum?

3. Comparing your online with your face-to-face students, which group...

FACE-TO-FACE students No difference Online students

- Is better prepared
- Works harder
- Is better organized
- Knows you better
- Do you feel you know better academically
- Do you feel you know better personally

4. Does your online course capitalize on having students in different physical locations? If so, how?

5. Since you taught your first online course, have you also taught face-to-face courses?

Yes, the same course(s)

Yes, similar course(s)

Yes, but different courses (i.e., I teach different courses face-to-face than I do online)

No, I have been teaching only online courses

THOUGHT QUESTIONS

These questions ask about specific aspects of teaching face-to-face after teaching online that we would like to learn more about. We would appreciate your answering as many of these questions as you have time for.

1. Have you been able to translate the participation that can be mandated in an online classroom (for instance, by requiring all students to contribute to a Discussion Forum) back to the classroom? If so, how did you accomplish this?

2. Have you been able to translate the time for thought/reflection that is one outcome of the asynchronous nature of the online classroom back to the face-to-face classroom? If so, how did you accomplish this?

3. Have your facilitation or questioning techniques changed as a result of your experience teaching online? If so, how did they change and what effect do you think this has had on your students?

4. Have you been able to translate the independent learning/responsibility for own learning/independence of your online students back into the classroom? If so, how did you accomplish this?

5. Have you seen positive changes in your school, from either the teacher or student perspective, as a result of your teaching online?

Thank you!

1. Thank you for your help. If you have questions or additional comments, please feel free to include them here.

2. Would you like to receive the results of this study once it is completed?

Yes

No

Email (if different this one)

Hit DONE if you are finished.