

Exhibit 4a. Purely Online Versus Face-to-Face (Category 1) Studies Included in the Meta-Analysis

Authors	Title	Effect Size		95-Percent Confidence Interval		Test of Null Hypothesis (2-tail)	Retention Rate (percentage)		Number of Units Assigned ^a
		<i>g</i>	<i>SE</i>	Lower Limit	Upper Limit	Z-Value	Online	Face-to-Face	
Beeckman et al. (2008)	Pressure ulcers: E-learning to improve classification by nurses and nursing students	+0.187	0.137	-0.082	0.455	1.36	Unknown	Unknown	426 participants
Bello et al. (2005)	Online vs. live methods for teaching difficult airway management to anesthesiology residents	+0.210	0.264	-0.308	0.728	0.79	100	100	56 participants
Benjamin et al. (2007)	A randomized controlled trial comparing Web to in-person training for child care health consultants	+0.046	0.340	-0.620	0.713	0.14	Unknown	Unknown	23 participants
Beyea et al. (2008)	Evaluation of a particle repositioning maneuver Web-based teaching module	+0.790	0.493	-0.176	1.756	1.60	Unknown	Unknown	17–20 participants ^b
Caldwell (2006)	A comparative study of traditional, Web-based and online instructional modalities in a computer programming course	+0.132	0.310	-0.476	0.740	0.43	100	100	60 students
Cavus, Uzonboyulu and Ibrahim (2007)	Assessing the success rate of students using a learning management system together with a collaborative tool in Web-based teaching of programming languages	+0.466	0.335	-0.190	1.122	1.39	Unknown	Unknown	54 students
Davis et al. (1999)	Developing online courses: A comparison of Web-based instruction with traditional instruction	+0.379	0.339	-0.285	1.042	1.12	Unknown	Unknown	2 courses/ classrooms
Hairston (2007)	Employees' attitudes toward e-learning: Implications for policy in industry environments	+0.028	0.155	-0.275	0.331	0.18	70	58.33	168 participants
Harris et al. (2008)	Educating generalist physicians about chronic pain with live experts and online education	+0.285	0.252	-0.209	0.779	1.13	84.21	94.44	62 participants
Hugenholtzet al. (2008)	Effectiveness of e-learning in continuing medical education for occupational physicians	+0.111	0.233	-0.346	0.569	0.48	Unknown	Unknown	72 participants
Jang et al. (2005)	Effects of a Web-based teaching method on undergraduate nursing students' learning of electrocardiography	+0.530	0.197	0.143	0.917	2.69**	85.71	87.93	105 students

Exhibit 4a. Purely Online Versus Face-to-Face (Category 1) Studies Included in the Meta-Analysis (continued)

Authors	Title	Effect Size		95-Percent Confidence Interval		Test of Null Hypothesis (2-tail)	Retention Rate (percentage)		Number of Units Assigned ^a
		<i>g</i>	<i>SE</i>	Lower Limit	Upper Limit	Z-Value	Online	Face-to-Face	
LaRose, Gregg and Eastin (1998)	Audiographic telecourses for the Web: An experiment	+0.070	0.281	-0.481	0.621	0.25	Unknown	Unknown	49 students
Lowry (2007)	Effects of online versus face-to-face professional development with a team-based learning community approach on teachers' application of a new instructional practice	-0.281	0.335	-0.937	0.370	-0.84	80	93.55	53 students
Mentzer, Cryan and Teclehairmanot (2007)	A comparison of face-to-face and Web-based classrooms	-0.796	0.339	-1.460	-0.131	-2.35*	Unknown	Unknown	36 students
Nguyen et al. (2008)	Randomized controlled trial of an Internet-based versus face-to-face dyspnea self-management program for patients with chronic obstructive pulmonary disease: Pilot study	+0.292	0.316	-0.327	0.910	0.93	Unknown	Unknown	39 participants
Ocker and Yaverbaum (1999)	Asynchronous computer-mediated communication versus face-to-face collaboration: Results on student learning, quality and satisfaction	-0.030	0.214	-0.449	0.389	-0.14	Unknown	Unknown	43 students
Padalino and Peres (2007)	E-learning: A comparative study for knowledge apprehension among nurses	0.115	0.281	-0.437	0.666	0.41	Unknown	Unknown	49 participants
Peterson and Bond (2004)	Online compared to face-to-face teacher preparation for learning standards-based planning skills	+0.100	0.214	-0.320	0.520	0.47	Unknown	Unknown	4 sections
Schmeckle (2003)	Online training: An evaluation of the effectiveness and efficiency of training law enforcement personnel over the Internet	-0.106	0.198	-0.494	0.282	-0.53	Unknown	Unknown	101 students
Schoenfeld-Tacher, McConnell and Graham (2001)	Do no harm: A comparison of the effects of online vs. traditional delivery media on a science course	+0.800	0.459	-0.100	1.700	1.74	100	99.94	Unknown

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Authors	Title	Effect Size		95-Percent Confidence Interval		Test of Null Hypothesis (2-tail)	Retention Rate (percentage)		Number of Units Assigned ^a
		<i>g</i>	<i>SE</i>	Lower Limit	Upper Limit	Z-Value	Online	Face-to-Face	
Sexton, Raven and Newman (2002)	A comparison of traditional and World Wide Web methodologies, computer anxiety, and higher order thinking skills in the inservice training of Mississippi 4-H extension agents	-0.422	0.385	-1.177	0.332	-1.10	Unknown	Unknown	26 students
Sun, Lin and Yu (2008)	A study on learning effect among different learning styles in a Web-based lab of science for elementary school students	+0.180	0.187	-0.187	0.547	0.96	Unknown	Unknown	4 classrooms
Turner et al. (2006)	Web-based learning versus standardized patients for teaching clinical diagnosis: A randomized, controlled, crossover trial	+0.242	0.367	-0.477	0.960	0.66	Unknown	Unknown	30 students
Vandeweerd et al. (2007)	Teaching veterinary radiography by e-learning versus structured tutorial: A randomized, single-blinded controlled trial	+0.144	0.207	-0.262	0.550	0.70	Unknown	Unknown	92 students
Wallace and Clariana (2000)	Achievement predictors for a computer-applications module delivered online	+0.109	0.206	-0.295	0.513	0.53	Unknown	Unknown	4 sections
Wang (2008)	Developing and evaluating an interactive multimedia instructional tool: Learning outcomes and user experiences of optometry students	-0.071	0.136	-0.338	0.195	-0.53	Unknown	Unknown	4 sections ^c
Zhang (2005)	Interactive multimedia-based e-learning: A study of effectiveness	+0.381	0.339	-0.283	1.045	1.12	Unknown	Unknown	51 students
Zhang et al. (2006)	Instructional video in e-learning: Assessing the effect of interactive video on learning effectiveness	+0.499	0.244	0.022	0.977	2.05*	Unknown	Unknown	69 students

Exhibit reads: The effect size for the Hugenholtz et al. (2008) study of online medical education was +0.11, which was not significantly different from 0.

* $p < .05$, ** $p < .01$, SE = Standard error

^a The number given represents the assigned units at study conclusion. It excludes units that attrited.

^b Two outcome measures were used to compute one effect size. The first outcome measure was completed by 17 participants, and the second outcome measure was completed by 20 participants.

^c This study is a crossover study. The number of units represents those assigned to treatment and control conditions in the first round.

Exhibit 4b. Blended Versus Face-to-Face (Category 2) Studies Included in the Meta-Analysis

Authors	Title	Effect Size		95-Percent Confidence Interval		Test of Null Hypothesis (2-tail)	Retention Rate (percentage)		Number of Units Assigned ^a
		<i>g</i>	<i>SE</i>	Lower Limit	Upper Limit	Z-Value	Online	Face-to-Face	
Aberson et al. (2003)	Evaluation of an interactive tutorial for teaching hypothesis testing concepts	+0.700	0.404	-0.092	1.492	1.73	Unknown	.75	2 sections
Al-Jarf (2004)	The effects of Web-based learning on struggling EFL college writers	+0.740	0.194	0.360	1.120	3.82***	Unknown	Unknown	113 students
Caldwell (2006)	A comparative study of traditional, Web-based and online instructional modalities in a computer programming course	+0.251	0.311	-0.359	0.861	0.81	100	100	60 students
Davis et al. (1999)	Developing online courses: A comparison of Web-based instruction with traditional instruction	+0.335	0.338	-0.327	0.997	0.99	Unknown	Unknown	2 courses/ classrooms
Day, Raven and Newman (1998)	The effects of World Wide Web instruction and traditional instruction and learning styles on achievement and changes in student attitudes in a technical writing in agricomunication course	+1.113	0.289	0.546	1.679	3.85***	89.66	96.55	2 sections
DeBord, Aruguete and Muhlig (2004)	Are computer-assisted teaching methods effective?	+0.130	0.188	-0.239	0.499	0.69	Unknown	Unknown	112 students
El-Deghaidy and Nouby (2008)	Effectiveness of a blended e-learning cooperative approach in an Egyptian teacher education program	+0.475	0.386	-0.282	1.232	1.23	Unknown	Unknown	26 students
Englert et al. (2007)	Scaffolding the writing of students with disabilities through procedural facilitation using an Internet-based technology	+0.740	0.345	0.064	1.416	2.15*	Unknown	Unknown	6 classrooms from 5 urban schools
Frederickson, Reed and Clifford (2005)	Evaluating Web-supported learning versus lecture-based teaching: Quantitative and qualitative perspectives	+0.138	0.345	-0.539	0.814	0.40	Unknown	Unknown	2 sections
Gilliver, Randall and Pok (1998)	Learning in cyberspace: Shaping the future	+0.477	0.111	0.260	0.693	4.31***	Unknown	Unknown	24 classes
Long and Jennings (2005) [Wave 1] ^c	The effect of technology and professional development on student achievement	+0.025	0.046	-0.066	0.116	0.53	Unknown	Unknown	9 schools

Exhibit 4b: Blended versus Face-to-Face (Category 2) Studies Included in the Meta-analysis (continued)

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		g	SE	Lower Limit	Upper Limit	Z-Value	Online	Face-to-Face	
Long and Jennings (2005) [Wave 2] ^c	The effect of technology and professional development on student achievement	+0.554	0.098	0.362	0.747	5.65***	Unknown	Unknown	6 teachers
Maki and Maki (2002)	Multimedia comprehension skill predicts differential outcomes of Web-based and lecture courses	+0.171	0.160	-0.144	0.485	1.06	91.01	88.10	155 students
Midmer, Kahan and Marlow (2006)	Effects of a distance learning program on physicians' opioid- and benzodiazepine-prescribing skills	+0.332	0.213	-0.085	0.750	1.56m	Unknown	Unknown	88 students
O'Dwyer, Carey and Kleiman (2007)	A study of the effectiveness of the Louisiana algebra I online course	+0.373	0.094	0.190	0.557	3.99***	88.51	64.4	Unknown ^b
Rockman et al. (2007) [Writing] ^c	ED PACE final report	-0.239	0.102	-0.438	-0.039	-2.34*	Unknown	Unknown	28 classrooms
Rockman et al. (2007) [Multiple-choice test] ^c	ED PACE final report	-0.146	0.102	-0.345	0.054	-1.43	Unknown	Unknown	28 classrooms
Schilling et al. (2006) [Search strategies] ^c	An interactive Web-based curriculum on evidence-based medicine: Design and effectiveness	+0.585	0.188	0.216	0.953	3.11**	68.66	59.62	Unknown
Schilling et al. (2006) [Quality of care calculation] ^c	An interactive Web-based curriculum on evidence-based medicine: Design and effectiveness	+0.926	0.183	0.567	1.285	5.05***	66.42	86.54	Unknown
Spires et al. (2001)	Exploring the academic self within an electronic mail environment	+0.571	0.357	-0.130	1.271	1.60	Unknown	100.00	31 students
Suter and Perry (1997)	Evaluation by electronic mail	+0.140	0.167	-0.188	0.468	0.84	Unknown	Unknown	Unknown

Exhibit 4b: Blended versus Face-to-Face (Category 2) Studies Included in the Meta-analysis (continued)

Authors	Title	Effect Size		95-Percent Confidence Interval		Test of Null Hypothesis (2-tail)	Retention Rate (percentage)		Number of Units Assigned ^a
		g	SE	Lower Limit	Upper Limit	Z-Value	Online	Face-to-Face	
Urban (2006)	A comparison of computer-based distance education and traditional tutorial sessions in supplemental instruction for students at-risk for academic difficulties	+0.264	0.192	-0.112	0.639	1.37	96.86	73.85	110 students
Zacharia (2007)	Comparing and combining real and virtual experimentation: An effort to enhance students' conceptual understanding of electric circuits	+0.570	0.216	0.147	0.993	2.64**	100	95.56	88 students

Exhibit reads: The effect size for the Aberson et al. (2003) study of an interactive tutorial on hypothesis testing was +0.70, which was not significantly different from 0.

* $p < .05$, ** $p < .01$, *** $p < .001$, SE = Standard error.

^a This number represents the assigned units at study conclusion. It excludes units that attrited.

^b The study involved 18 online classrooms from six districts and two private schools; the same six districts were asked to identify comparable face-to-face classrooms, but the study does not report how many of those classrooms participated.

^c Two independent contrasts were contained in this article, which therefore appears twice in the table.