Goldman Sachs

Internet: e-Learning
United States

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The birth of a vibrant industry. e-Learning enjoys competitive advantage over traditional education and is likely to grow rapidly. Corporate training, higher education, and K-12 are the most promising sectors for long-run value creation; we recommend a bottoms-up approach to investing in the sector.

The Internet is revolutionizing education

The Internet's ability to store and deliver vast amounts of educational content is the primary driver behind the adoption of e-Learning in corporate training, higher education, and K-12.

Corporate training is our favorite e-Learning sector

This well-defined $63-billion B2B vertical enjoys sustainable competitive advantage over traditional corporate training, and it should continue to create profitable opportunities for investors.

e-Learning adoption is likely in higher education and K-12

Schools and students are discovering the benefits of e-Learning; investors are likely to encounter compelling opportunities created by this excitement. Higher education e-Learning targets both on-campus populations and distance learners; while K-12 e-Learning addresses both the home and school markets.

We recommend a bottoms-up approach to investing in e-Learning

Strong industry fundamentals have not been enough to support solid price performance from all e-Learning companies. Investors should pay particular attention to the technology, distribution, and management team in place before investing in any e-Learning company.

Like most Internet industries, e-Learning carries several risks

Continually shifting technology, low barriers to entry, the need for major behavioral changes on the part of consumers, companies going public shortly after switching from product development to revenue generation, and a lack of broadly demonstrated profitability are the most salient e-Learning risk factors.

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Company	GS Rating	Price (a)	Mkt Cap ($ mn)	EPS 2000E ($)	P/S 2000E (X)	P/E 2000E (X)
DigitalThink (b)	MP	$52.00	$1,763	($0.68)	56.2	—
Saba (b)	MO	$19.50	$756	($1.52)	17.4	—
SmartForce	RL	$48.75	$2,486	($0.43)	15.4	—
Sylvan	MP	$11.81	$609	$0.40	—	29.5

(a) Priced at market close of July 24, 2000.
(b) Forecasts for FY2001E and FY2002E, respectively.

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The prices in this report are based on the market close of July 24, 2000.

Overview: The birth of a vibrant industry

e-Learning enjoys competitive advantage over traditional education and is likely to grow rapidly. Corporate training, higher education, and kindergarten through 12th grade (K-12) are the most promising sectors for long-run value creation; we recommend a bottoms-up approach to investing in the sector.

- e-Learning represents the marriage of the Internet and education
- e-Learning's prospects for robust profitability should attract investors
- Corporate training is our favorite e-Learning sector
- SmartForce is on our US Recommended for Purchase List
- Like most Internet industries, e-Learning possesses above-average risk

e-Learning represents the marriage of the Internet and education

e-Learning is an emerging industry that utilizes high technology to provide and administer corporate training, higher education, and K-12 education. Its rapid growth is propelled by the Internet and the enormous opportunity embedded in global education.

e-Learning's prospects for robust profitability should attract investors

- We have initiated coverage of the e-Learning industry: SmartForce is on our US Recommended for Purchase List, and we rate Saba stock a Market Outperformer and the shares of DigitalThink and Sylvan Market Performers.
- e-Learning is in the early stages of an extended upswing and its growth should significantly outpace that of the market for years to come. We believe that e-Learning across the corporate training, higher education, and K-12 sectors can generate compound annual growth rates (CAGRs) of 20%-60% for the foreseeable future.
- The market opportunity for e-Learning is vast. A broad measure of e-Learning's potential is the approximately $646 billion spent on corporate training, higher education, and K-12 schooling in the United States in 1999. While e-Learning will never capture 100% of this market, we believe that it can generate billions in new wealth for investors off relatively small market shares.
- Solid fundamentals and economic models foretell sustainable profitability for e-Learning companies. Propelled by the enormous possibilities unlocked by the Internet, e-Learning can deliver more value at less cost than traditional education. This competitive advantage, coupled with high operating leverage for e-Learning companies, should translate into high margins and returns on capital in the industry.

Corporate training is our favorite e-Learning sector

- This $63-billion business-to-business (B2B) vertical is well defined: its buyers are easy to identify, purchasing criteria clear, and profitable revenue opportunities easily found.
- Corporate e-Learning's value proposition, namely its ability to drive higher value at lower cost for corporations and their extended enterprises, is substantiated by impressive customer wins and partnerships in the sector.
- As revealed by a Porter's Five Forces framework, the industry structure of corporate training should ensure high levels of profitability for corporate e-Learning companies.

SmartForce is on our US Recommended for Purchase List

Our favorite e-Learning stock, SmartForce, an approximately $2.5-billion market-capitalization leader in the corporate e-Learning sector, is on our US Recommended List because it has

- the broadest product solution in the industry;
- the largest development team, sales force, and customer base in the industry;
- impressive traction of its e-Learning offering, which heralds accelerating growth; and
- below-average valuation and market expectations coupled with decreasing risk.

Like most Internet industries, e-Learning possesses above-average risk

Risks endemic to the e-Learning industry include

- major behavioral changes required of learners and buyers of education;
- barriers to entry that tend to be low (accreditation for on-line universities is an exception); and
- an underlying technology that is in flux, which fuels a volatile competitive environment.

Common weaknesses across several e-Learning companies include

- going public shortly after switching from product development to revenue generation;
- shifting technology embedded in product offerings, while trying to deliver consistent financial results;
- having lengthy paths to profitability, which reflect ongoing investments in sales and marketing and research and development; and
- facing competitive threats from larger non e-Learning companies that are well positioned to provide e-Learning.

Sector-level investment highlights: A profile of e-Learning

e-Learning is a young and vibrant industry. Corporate training, higher education, and K-12 are three sectors within the industry that hold promise for long-run value creation. e-Learning enjoys a competitive advantage over traditional education and is likely to grow rapidly. We recommend a bottoms-up approach to investing in the sector.

We have initiated coverage of the e-Learning industry and the following e-Learning companies: DigitalThink, Saba Software, SmartForce, and Sylvan Learning Systems. We have transferred primary coverage of SmartForce to David Derman in New York from Charles Elliott in London and have upgraded the stock to our US Recommended for Purchase List. We currently co-cover Saba with Tom Berquist in Menlo Park and rate the stock a Market Outperformer. We rate the shares of DigitalThink and Sylvan Market Performers.

What is e-Learning?

e-Learning is an emerging industry that utilizes high technology to provide and administer corporate training, higher education, and K-12 education. Its rapid growth is propelled by the Internet and the enormous opportunity embedded in global education.

Can investors make money in e-Learning?

We believe they can. e-Learning, across corporate training, higher education, and K-12, benefits from sustainable competitive advantages relative to traditional education—it can generate more value at less cost than can traditional education. This fundamental strength, combined with the massive size of global education, should support the profitable development of several multibillion dollar e-Learning companies.

Have investors made money in e-Learning?

Some have, but most have not. Changing technology, immature markets, and unproven business models and management teams are the main historical weaknesses of e-Learning companies. Despite the immense opportunities across the sector, selective investing is key to success.

Why is e-Learning a hot topic?

A combination of increased initial public offering (IPO) activity and media attention has made e-Learning a hot topic. This, in turn, is driven by the approaching reality of e-Learning experiences: immersive distance learning, computer-centric school instruction, instant and enterprise-wide corporate training, and so on. At its heart, the buzz surrounding e-Learning is created by the Internet's ability to rapidly deliver and store vast amounts of educational content.

Is e-Learning the next killer app?

We believe that e-Learning is here to stay; we expect its growth to be rapid and its final size to be large. Nonetheless, we do not believe that e-Learning is a "killer app." e-Learning is typically sold via a direct sales force, which slows its spread. Corporate e-Learning aside, e-Learning generally attracts little focus from private-sector customers and is specialized enough to lack broad social appeal.

How big is e-Learning?

A broad measure of e-Learning's potential is total US spending on education. In addition, we have built industry models to size e-Learning's share of this large pie (see Exhibit 1).

Exhibit 1: e-Learning is worth $17.2 billion; America spent $646 billion on education
spending is billions of 1999 dollars; NPV is billions of current dollars

Segment	Est. '99 Spending	Est. e-Learning NPV
Higher Education	$233	$3.5
Corporate Training	63	10.4
K-12	351	3.2
Total Spending	**$646**	**$17.1**

Note: Higher education NPV excludes potential revenues from advertising and e-Commerce.

Source: GS Research estimates, National Center for Education Statistics, Training Magazine.

Forecasting e-Learning's share of the larger education pie is necessarily an imprecise effort, and our estimates should be read as rough indicators of the industry's potential.

Our best estimates for each of the three e-Learning sectors are shown in Exhibits 2-4.

Exhibit 2: Corporate e-Learning is currently worth an estimated $10.4 billion
$ millions

	2000	2001	2002	2003	2004	2005	2006	2007
Industy Revenues	$1,500	$2,100	$2,940	$4,116	$5,762	$8,067	$11,294	$15,812
After-tax operating cash flow	135	189	265	370	519	726	1016	1423
Present value of cash flow	128	161	204	257	324	409	515	650
Terminal Value (12X '07 OCF)								7799
NPV of Corporate e-Learning	**$10,447**							

Note: Forecast assumes revenue CAGR of 40%, operating margin of 15%, cost of capital of 11%, and a tax rate of 40%.

Source: GS Research estimates.

We forecast $10.4 billion in 2000 revenues for the entire corporate e-Learning industry, as shown in Exhibit 2. Investors do not have the opportunity to capture all of this value directly because some e-Learning is provided by technology companies (e.g., IBM, Oracle, Cisco), and some is provided by private companies. Still, we expect investors to face several multibillion dollar opportunities in this space.

Like corporate e-Learning, higher education also represents a substantial opportunity (see Exhibit 3).

Exhibit 3: Higher education distance learning is worth an estimated $3.5 billion
$ millions

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Distance Learning Revenue	$1,103	$1,379	$1,724	$2,155	$2,693	$3,367	$4,208	$5,260	$6,576
After-tax operating cash flow	99	124	155	194	242	303	379	473	592
Present value of cash flow	77	86	97	109	123	139	156	176	198
Terminal Value (12X '10 OCF)									7102
NPV of Distance Learning	$3,537								

Note: Forecast assumes revenue CAGR of 25%, operating margin of 15%, cost of capital of 11%, and a tax rate of 40%.

Source: GS Research estimates.

In the context of Exhibit 3, distance learning revenues are generated by tuition and fees from courses delivered over the Internet. Most of these revenues are currently paid to traditional higher education institutions, but for-profit providers are increasingly competing for a share of them.

In addition to distance learning, higher education e-Learning may generate value through advertising and e-Commerce targeted at students. Since there are more than 14 million students in the United States alone, this opportunity is meaningful and potentially worth billions. This market is too young for us to size, but it could exceed the value of distance learning.

The final e-Learning sector with meaningful potential is K-12 (see Exhibit 4).

Exhibit 4: K-12 e-Learning is worth an estimated $3.0 billion
$ millions

	2003	2004	2005	2006	2007	2008	2009	2010
Industry Revenue	$992	$1,290	$1,677	$2,180	$2,834	$3,684	$4,789	$6,226
After-tax operating cash flow	89	116	151	196	255	332	431	560
Present value of cash flow	62	73	85	99	116	136	160	187
Terminal Value								2245
Net present value	$3,163							

Note: Forecast assumes revenue CAGR of 30%, operating margin of 15%, cost of capital of 11%, and a tax rate of 40%.

Source: GS Research estimates.

Our K-12 forecast incorporates both home and school spending. As there is currently no reported home spending on Web-based K-12 e-Learning, this forecast has a larger margin of error.

What is the best sector to invest in e-Learning?

While we believe all three e-Learning sectors contain compelling opportunities, our favorite sector is corporate training.

Since the market for e-Learning is still forming, we first test how well defined each e-Learning segment is (see Exhibit 5).

Exhibit 5: Corporate training is the most well-defined e-Learning sector
1=low, 10=high

	Corporate Training	Higher Education	K-12
Are the buyers easy to identify?	8	5	6
Are the purchasing criteria clear?	8	6	4
Are profitable revenue opportunities easily found?	9	5	6
Average Score	**8.3**	**5.3**	**5.3**

Note: We use three questions to test the definition of an e-Learning sector.

Source: GS Research estimates.

e-Learning is in its nascent stages, and the relatively well-defined contours of the corporate e-Learning market contribute to its attractiveness. Next, we consider the competitive advantage of e-Learning in each segment (see Exhibit 6).

Exhibit 6: Corporate and higher education have the strongest competitive advantage
1=low, 10=high

	Corporate Training	Higher Education	K-12
More value for enterprises	9	7	5
More value for individuals	6	7	6
Less cost for enterprises	8	6	5
Less cost for individuals	6	7	6
Average Score	**6.7**	**6.7**	**5.7**

Note: Competitive advantage = ability to create more value at lower cost.

Source: GS Research estimates.

All forms of e-Learning enjoy strong sources of competitive advantage over traditional education. Corporate training ties higher education for the strongest competitive advantage, but K-12 also enjoys meaningful advantages.

Finally, we consider the potential for ongoing profitability in each e-Learning sector, as illustrated by a Porter's Five Forces analysis (see Exhibit 7).

Exhibit 7: Each sector can generate sustained profits
1=high threat, 10=low threat

	Corporate Training	Higher Education	K-12
Force 1: New Entrants	3	5	3
Force 2: Existing Competitors	5	7	6
Force 3: Substitutes	8	7	5
Force 4: Buyers	6	7	6
Force 5: Suppliers	8	8	8
Average Score	**6**	**6.8**	**5.6**

Source: Porter's Five Forces analysis; GS Research estimates.

Higher education is best-positioned to generate sustained periods of above-average profitability, but all three e-Learning sectors are relatively well positioned for sustained profitability. We expect barriers to entry in corporate training and K-12 to rise as companies build customer loyalty and increase product differentiation.

The combination of a large, well-defined market, strong competitive advantage, and above-average Porter's ranking make corporate e-Learning our favorite e-Learning segment.

Who are the main e-Learning competitors?

e-Learning competitors fall into two main groups: incumbents and upstarts. There is little competition between the two, but e-Learning's promise of growth and profits should lead to increased clashes between them.

The competitors in the corporate e-Learning space are numerous (see Exhibit 8).

Exhibit 8: Corporate training e-Learning competitors

Upstarts

Technology Providers	Portal Providers	Content Providers	
		I.T.	Productivity
Caliber.com	Click2Learn.com	DigitalThink.com	Ninth House.com
Centra.com	CyberU.com	ElementK.com	Pensare.com
Docent.com	Headlight.com	Knowledgenet.com	Skillsoft.com
Eloquent.com	KnowledgePlanet.com	NETg.com	SmartForce.com
Placeware.com	TrainingNet.com	SmartForce.com	Unext.com
Saba.com			UniversityAccess.com

Incumbents

Technology	Professional Services	Instructor-Led Training
Cisco	Arthur Anderson	American Management Association
Dell	Deloitte & Touche	Apollo Group
Hewlett-Packard	Ernst and Young	Community colleges
IBM (Lotus, Mindspan)	kForce	DeVry
Microsoft	KPMG	Global Knowledge Network
Motorola	Manpower	Learning Tree
Oracle	PWC	New Horizons
Sun	Scient	
	Viant	

Note: Upstarts focus only on e-Learning; incumbents are existing companies well-positioned to provide e-Learning.

Source: GS Research.

As with corporate e-Learning, higher education is also filled with a full field of potential competitors (see Exhibit 9).

Exhibit 9: Higher education e-Learning competitors

Upstarts

Portal Providers	Infrastructure Providers	Online Schools
Collegeclub.com	Blackboard.com	Capella.edu
Jenzabar.com	Campuspipeline.com	Jonesinternational.edu
MascotNetwork.com	Ecollege.com	Kaplancollege.com
StudentAdvantage.com	Eduprise.com	Online.keller.edu
Youthstream.com	Webct.com	Online.uophx.edu

Incumbents

Technology	Publishers	Educational institutions
Cisco	Follett	Business schools
Compaq	Harcourt	Continuing education
Datatel	Houghlin-Mifflin	Correspondence schools
Dell	Pearson	Engineering schools
Gateway	Random House	Law schools
Microsoft		Medical schools
Oracle		
PeopleSoft		
SAP		
SCT		
Sun		

Note: Upstarts focus only on e-Learning; incumbents are existing companies well-positioned to provide e-Learning.

Source: GS Research.

K-12 e-Learning also has a full complement of potential competitors (see Exhibit 10).

Exhibit 10: K-12 e-Learning competitors

Upstarts

Portal Providers	Content Providers	Infrastructure
Bigchalk.com	AdvantageLearning.com	iMind.com
ClassroomConnect.com	Apex.com	NCS.com
Copernicus (EdGate.com)	Bigchalk.com	Netschools.com
Family Education Network (Fen.com)	Computer Curriculum Corp. (ccclearn.com)	nSchool.com
Lightspan.com	Lightspan.com	Powerschool.com
ZapMe.com	Riverdeep.com	Schoolcenter.com
	ScientificLearning.com	SchoolCity.com
	SmarterKids.com	Thinkwave.com
		wwwrrr.com

Incumbents

Technology	Publishers	Miscellaneous
Apple	Follett	AOL
Compaq	Harcourt	Kaplan
Dell	Houghlin-Mifflin	Princeton Review
Gateway	Pearson	School Specialty
IBM	Primedia	Sylvan
Microsoft	Random House	Yahoo!
Sun	Scholastic	

Note: Upstarts focus only on e-Learning; incumbents are existing companies well-positioned to provide e-Learning.

Source: GS Research.

Increased e-Learning competition between all business types is likely to increase. The expected high growth rates and compelling economics of e-Learning should allow for intense competition and sustained profitability in the industry.

What traits are valuable for an e-Learning company?

The following three qualities are critical e-Learning success factors that are often lacking in companies:

- Technology that meets customer needs and is easily updated
- A sales model that scales well and rapidly
- A management team that is strategically, tactically, and e-Learning savvy

Incidentally, a strong brand is not a competitive plus in e-Learning. e-Learning, and most of the companies providing it, are too young to have established credible brands.

What are the risks to investing in e-Learning?

As the poor performance of many e-Learning stocks indicates, investment in e-Learning can be riskier than investing in the average industry.

Common weaknesses across several e-Learning companies include:

- going public shortly after switching from product development to revenue generation;
- shifting technology embedded in product offerings, while trying to deliver consistent financial results;
- having lengthy paths to profitability, which reflect ongoing investments in sales and marketing and research and development; and
- facing competitive threats from larger non e-Learning companies well positioned to provide e-Learning.

Beyond these typical company-level problems, there are also some risks endemic to e-Learning as an industry because

- e-Learning requires major behavioral changes from learners and buyers of education;
- barriers to entry tend to be low (accreditation for on-line universities is an exception); and
- the technology underlying e-Learning is in flux, which fuels a volatile competitive environment.

The relatively high level of risk accompanying e-Learning is typical of Internet industries, but is accompanied by the possibility of high returns.

When is the right time to invest in e-Learning?

We believe this is a good time to make selected e-Learning investments. e-Learning is at the early stages of what we expect to be a lengthy growth period, and dominant e-Learning franchises are being established today. Industry growth alone, however, is not a sufficient criterion for making an e-Learning investment. Careful company analysis is critical in this sector because only a few companies are likely to earn large market shares, while the rest compete for secondary roles. In the corporate e-Learning space, we highlight SmartForce (on our US Recommended List) and Saba (rated a Market Outperformer). Generally, we support a bottoms-up approach to analyzing e-Learning investment opportunities.

How we value an e-Learning company

Most e-Learning companies currently generate large losses and trade on market expectations for their ability to create substantial value in the distant future. These qualities make it difficult for investors to apply standard valuation approaches, such as P/E multiples and discounted cash flow (DCF) analyses, to e-Learning businesses. We advocate a new valuation approach, which we call expanded net present value (NPV), to measure the worth of e-Learning companies.

New valuation for a New Economy

The sudden rise of the Internet economy and the seemingly startling valuations for Internet companies has created divergent views in the investment community. Traditional valuation practitioners look to Internet companies and, finding little in the way of tangible assets and positive cash flow, tend to dismiss their valuations as outlandish. More progressive analysts argue that intangible assets (e.g., human capital, brands) and future operations justify current valuations, but even those analysts are hard pressed to quantify their views.

Ideally, a valuation approach for New Economy companies would combine the financial rigor of traditional techniques (e.g., DCF) with the strategic insights of newer approaches (e.g., intangible assets as a prime source of value). This approach would

- utilize a consistent framework,
- draw on well-accepted valuation techniques that are economically sensible, and
- conform to reality in its ability to value both tangible and intangible assets.

Expanded NPV = DCF + real options premia

Our expanded NPV approach attributes a company's value to two sources: cash flows and real options. The DCF component of expanded NPV measures the value of a company's current operations. It relates the value of a company as if that company had selected one operating strategy today and pursued it forever. The real options component of expanded NPV recognizes that a company is flexible, and that active management can create new sources of value not present in current operations. It recognizes that intangibles like strategic position, management, and brand create value beyond a company's present day operations.

Expanded NPV meets the three criteria we set for valuing New Economy companies:

- Its formulaic nature ensures its **consistency.**
- Its reliance on DCF and real options valuation supports its **economic sensibility.**
- Its focus on cash flows and real options captures value from both **tangible and intangible assets.**

What are real options, and when are they valuable?

Generically, an option is the right but not obligation to pursue a course of action. Many investors are familiar with financial options like calls and puts. A call option is the right, but not obligation, to acquire an asset at a given point in time for a specified price.

Real options are similar to financial options in most respects, except that exercising a real option results in the acquisition of real rather than financial assets. For instance, a biotechnology company may view its R&D investment as a collection of real call options, which enables it to acquire drugs that are profitable.

Real options are valuable because they reflect opportunities for companies to invest in new projects that expand wealth. The value of these options is not captured in a DCF because a DCF technique only values cash flows generated by a company's current operations. To the extent that corporations are able to invest the cash generated by their current operations in new projects whose returns exceed their cost of capital, the value of these corporations will be understated by a DCF. This incremental value, which can be relatively large, is captured by real options premia.

A standard Black-Scholes framework establishes an option's (financial or real) value as a function of five variables (see Exhibit 11).

Exhibit 11: Five variables determine the value of call options

Financial Option		Real Option
1) Stock price		1) Gross present value of project cash flows
2) Strike price		2) Required investment in project
3) Time till expiration		3) Time until investment decision must be made
4) Volatility of stock		4) Riskiness of project's assets
5) Risk-free rate		5) Risk-free rate

Note: Variables have similar interpretation for real and financial options; based on a Black-Scholes framework.

Source: GS Research.

Working within the context of a Black-Scholes world, we can make a few observations about factors that enhance the value of a call option.

First, the spread between the gross value of a project (variable 1) and the investment required in the project (variable 2) is critically important to the value of a call option. This spread is referred to as the intrinsic value of an option, and is the profit that would be realized immediately upon exercise of the option. Another factor that increases the value of an option is the time until it expires (variable 3)—the longer the life of an option, the more its value increases. Finally, the more risk involved in the project underlying an option, the more valuable the option. Increased risk is valuable because option holders only exercise their options in the case of upside returns and do not suffer losses from failure; for this reason, they value payoffs that are speculative.

With this abstract understanding of what determines the value of options, we can consider the types of companies and industries that stand to benefit from real options:

- Conditions that create intrinsic value (i.e., options that generate profits upon exercise) enhance the value of options. Intrinsic value exists in a real option when a company can generate returns on its capital that exceed its cost of capital. Usually, these opportunities exist for companies that occupy strong strategic positions in industries that are growing rapidly.

- Industries that are risky—whose ultimate size and competitive landscape is uncertain—create larger option value than more certain and established industries. Uncertain industries generate valuable options because they establish opportunities for management teams to take steps that create value and to ignore less promising opportunities. Investors in these industries benefit from asymmetrical payoffs; they profit from large potential positive returns with limited downside risk.

In conclusion, the following ingredients are critical for real options to be of substantial value:

- **Cash.** Without cash, companies cannot exercise options to invest in value-creating projects.

- **Strong strategic position.** Without a strong competitive position, a company will find it difficult to earn returns on its capital that exceed its cost of capital. That is, few of its real options will have any intrinsic value.

- **Industry growth and uncertainty.** Growth and uncertainty create the potential for returns on capital that exceed the cost of capital. They also create situations that allow active managers to add value through the careful evaluation of competing real options.

Suggested reading

We suggest that investors who wish to delve deeper into the theoretical underpinnings of our expanded NPV analysis read *Real Options: Managerial Flexibility and Strategy in Resource Allocation*, by Lenos Trigeorgis. This study of options theory was published by The MIT Press in 1996.

Tutorial: Expanded NPV analysis of SmartForce

In this section, we use SmartForce (on our US Recommended List), to walk investors through our expanded NPV analysis. This tutorial has four steps: DCF, value real options, assess market expectations for real options, and valuation conclusion.

Step one: DCF

Based on our DCF analysis, we estimate that SmartForce's current operations are worth $2.25 billion (see Exhibit 12).

Exhibit 12: SmartForce's current operations are worth $2.25 billion

	12/31/2000	12/31/2001	12/31/2002	12/31/2003	12/31/2004	12/31/2005	12/31/2006	12/31/2007	12/31/2008	12/31/2009	12/31/2010
Revenues											
Year-over-year growth		57%	38%	35%	35%	35%	35%	35%	25%	15%	10%
CAGR Since 2000		57%	47%	43%	41%	40%	39%	38%	37%	34%	31%
Net Margin	-19%	3%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Knowledgewell Amort. (% Rev.)	5%	3%	2%	2%	1%	1%	0.4%	0.3%	0.3%	0.2%	
D&A from PP&E (% Rev.)	7%	6%	5%	5%	4%	4%	4%	4%	4%	4%	5%
Working Cap. (% Rev.)	1.24%	1.01%	0.87%	0.76%	0.66%	0.58%	0.50%	0.44%	0.39%	0.37%	0.35%
Capex (% Rev.)	19%	14%	5%	4%	5%	5%	5%	5%	4%	3%	2%
Free cash flow margin	-27%	-3%	15%	15%	12%	12%	11%	11%	12%	14%	15%
Discount Factors (Cost of Capital: 13%)	95%	84%	74%	66%	58%	51%	45%	40%	36%	31%	28%
Terminal Value (Free Cash Flow Multiple)											16
Base Case DCF	12/31/2000	12/31/2001	12/31/2002	12/31/2003	12/31/2004	12/31/2005	12/31/2006	12/31/2007	12/31/2008	12/31/2009	12/31/2010
Revenues	161,427	254,000	350,000	472,500	637,875	861,131	1,162,527	1,569,412	1,961,765	2,256,029	2,481,632
Net Income	-30,776	7,241	46,719	61,425	82,924	111,947	151,129	204,024	255,029	293,284	322,612
Plus: Knowledgewell Amort.	7,946	7,946	7,946	7,946	7,946	4,996	4,996	4,996	4,996	4,996	
Plus: D&A from PP&E	11,210	15,904	18,619	21,464	27,210	34,967	45,439	59,577	73,209	83,434	112,730
Minus: Working Cap.	2,000	2,573	3,060	3,595	4,224	4,964	5,832	6,853	7,710	8,288	8,702
Minus: Capex	30,000	35,000	16,138	16,913	34,161	46,117	62,258	84,049	81,047	60,785	46,602
Free cash flow (FCF)	-43,621	-6,483	54,086	70,327	79,694	100,829	133,473	177,695	244,478	312,640	380,038
Terminal Value (TV)											6,080,600
Discount Factors (Cost of Capital: 13%)	95%	84%	74%	66%	58%	51%	45%	40%	36%	31%	28%
Present Value of FCF	-41,276	-5,429	40,080	46,120	46,235	51,767	60,643	71,447	86,962	98,413	105,866
Present Value of TV	1,693,857										
Net Present Value	**2,254,687**										

Source: GS Research estimates.

Not all of the value generated by SmartForce's current operations flows to investors. In fact, a substantial portion of this value belongs to employees, who have received stock options grants. The value of employee options grants must be deducted from the DCF value of SmartForce's current operations to arrive at the equity value of its current operations.

First, we value employees' 13.2-million options currently outstanding (see Exhibit 13). We assume a volatility of 40%; since the current stock options are well in the money,

this assumption is relatively unimportant. We also cut the effective life of these options from their contractual life of 8.7 years to 5.0 years to better reflect economic reality.

Exhibit 13: Value of options currently granted is $499 million
$ thousands, except shares outstanding

Options Outstanding	13,205,738
SMTF Stock Price	$50.00
Weighted Average Strike Price	$13.52
Weighted Average Life	5.00
Assumed Volatility (GS Research Estimate)	40%
Assumed Risk-free rate (GS Research Estimate)	6%
Total SMTF Shares Outstanding	50,990,000
Value of An Option	$37.77
Value of All Options Outstanding	**$498,752**

Note: SmartForce currently has 13.2 million options outstanding.

Source: SEC Filings, GS Research estimates.

Next, we forecast and value future stock options grants (see Exhibit 14). We assume that employees will receive 1.5 million stock options each year in the future, and that these options will be granted at the money with an effective life of 5.0 years. We forecast a future stock price for each year of the options grants by assuming that the return on SmartForce's stock matches its 13% cost of capital. We also forecast diminishing volatility from the future stock price, since we assume that the riskiness of the firm and industry will decrease with time.

Exhibit 14: Expected value of future options grants to employees is $495 million
$ thousands

Total value of grants forecated from 12/31/00 to 12/31/10	$325,451
Terminal value of options grants (10% of SmartForce's terminal value)	$169,386
Total expected value of future options grants	**$494,837**

Source: GS Research estimates.

To forecast our terminal value of stock options of $169 million, we assume that SmartForce will grant 10% of its terminal value to employees.

To calculate the equity value of SmartForce's current operations, we subtract the value of its stock options grants from the DCF NPV of its current operations.

We estimate that the residual equity value of SmartForce's current operations is $1.26 billion (see Exhibit 15).

Exhibit 15: Equity value of current operations is estimated at $1.26 billion
$ thousands

DCF NPV of SmartForce's Current Operations	$2,254,687
Minus: NPV of Expected Options Grants	993,589
Equity Value of SmartForce's Current Operations	**$1,261,098**

Source: GS Research estimates.

SmartForce's DCF value, less the value of employee stock options grants, is the residual equity value of SmartForce's current operations.

Step two: Value real options

Now that we have an equity value for SmartForce's current operations, we need to calculate the value of its real options to complete our expanded NPV analysis. These options represent the value of future projects not captured by our DCF analysis. The market has placed an implicit value on these projects, and our valuation approach now extracts what the market expects from SmartForce's new, future operations (see Exhibit 16).

Exhibit 16: Market values options to create value from new operations at $1.26 billion
$ thousands

SmartForce's Market Capitalization	$2,549,500
Minus: Excess Liquidity	30,558
Market Value of SmartForce's Operations	$2,518,942
Market Value of SmartForce's Operations	$2,518,942
Minus: Equity Value of SmartForce's Current Operations	1,261,098
Market Value of SmartForce's Future Options	$1,257,844

Source: GS Research estimates.

We now know that the market values SmartForce's options to create new, future projects at $1.26 billion. What we do not know, however, is the reasonableness of this expectation.

To measure the sensibility of the market's expectations for SmartForce's new operations, we must identify those points in time when it will have real options to create them.

Recall that there are three ingredients that create valuable real options:

- Cash
- Strong strategic position
- Industry growth and uncertainty

If an industry is growing and its evolution uncertain, companies in strong strategic positions produce real options whenever they generate excess cash.

In any year prior to the generation of that free cash flow, we assume that companies have one-year real options to invest the following year's free cash flow in new projects. That is, we assume that management will plan on investing the upcoming year's free cash flow in new projects during the year prior to the generation of that free cash flow.

Based on our company and industry models, we believe the three ingredients needed for valuable real options will create 19 real options for SmartForce. The earliest of these real options exists today, embedded in SmartForce's excess cash balance; the latest of them will be created by free cash flow (FCF) generated by the company in 2018 (see Exhibit 17).

Exhibit 17: SmartForce owns 19 options to create future economic value

06/27/00	2001	2002	2003	2004	2005	2006	2007	2008
Excess Cash Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option

Note: Options are created by a combination of free cash flow (FCF) and positive industry dynamics.

Source: GS Research estimates.

Step three: Assess market expectations for real options

We now know the points in time when SmartForce will have future real options, as well as the total value of all of these options—$1.26 billion. With a few additional assumptions, we can estimate the internal rates of return (IRRs) expected by the market for the projects underlying each of the company's future real options.

First, we constrain the IRR of each future project to be successively lower than the preceding project's IRR (i.e., we forecast that SmartForce will make its most profitable investments as soon as possible). Then, we require projects begun in 2019 and beyond to create no new economic value—we constrain them to meet their cost of capital. Finally, we have to assume a life span for each new project undertaken; we provide IRRs assuming both 10- and 20-year project lives.

We can now estimate the implicit IRR expected by the market for each of SmartForce's new operations from now through 2018 (see Exhibit 18).

Exhibit 18: SmartForce's IRRs range from 13.0% to 25.8%

	07/14/2000		2001	2002	2003	2004	2005	2006	2007	2008
	Excess Cash Option		FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option
Implicit IRR	19.2%		19.2%	18.8%	18.5%	18.1%	17.7%	17.3%	17.0%	16.6%
Assumed Project Life	20		20	20	20	20	20	20	20	20
Implicit IRR	**25.8%**		25.8%	25.0%	24.2%	23.4%	22.6%	21.8%	21.1%	20.3%
Assumed Project Life	**10**		10	10	10	10	10	10	10	10

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option	FCF Option
Implicit IRR	16.2%	15.9%	15.5%	15.1%	14.8%	14.4%	14.1%	13.7%	13.3%	**13.0%**
Assumed Project Life	20	20	20	20	20	20	20	20	20	**20**
Implicit IRR	19.6%	18.8%	18.1%	17.3%	16.6%	15.8%	15.1%	14.4%	13.7%	13.0%
Assumed Project Life	10	10	10	10	10	10	10	10	10	10

Source: GS Research estimates.

This expanded NPV analysis has allowed us to attribute SmartForce's market capitalization to current and future operations. Exhibit 18 reveals the market's explicit expectations for SmartForce's future operations.

Most noteworthy is the market's belief that SmartForce can generate IRRs in excess of the 13.0% cost of capital we assume for the company. The range of expected returns, from 13.0% to 25.8%, reveals healthy but not overly aggressive expectations. If SmartForce capitalizes on the opportunities before it, we fully expect it to earn returns well in excess of our assumed 13.0% cost of capital.

Step four: Valuation conclusion

Although the market's expectations for SmartForce's future operations are high, they are not the highest in the industry. In fact, the market currently has higher expectations for SmartForce's most direct comparable, DigitalThink (see Exhibit 19).

Exhibit 19: The market expects higher IRRs from DigitalThink's future projects than SmartForce's

	2001	2002	2003	2004	2005	2006	2007	2008	2009
DigitalThink's Implicit IRR	-	40.2%	38.4%	36.6%	34.8%	33.1%	31.4%	29.7%	28.0%
SmartForce's Implicit IRR	25.8%	25.0%	24.2%	23.4%	22.6%	21.8%	21.1%	20.3%	19.6%
Differential	**-**	**15.2%**	**14.2%**	**13.2%**	**12.2%**	**11.2%**	**10.3%**	**9.4%**	**8.5%**

	2010	2011	2012	2013	2014	2015	2016	2017	2018
DigitalThink's Implicit IRR	26.4%	24.7%	23.1%	21.5%	20.0%	18.4%	16.9%	15.4%	14.0%
SmartForce's Implicit IRR	18.8%	18.1%	17.3%	16.6%	15.8%	15.1%	14.4%	13.7%	13.0%
Differential	**7.6%**	**6.7%**	**5.8%**	**5.0%**	**4.1%**	**3.3%**	**2.5%**	**1.7%**	**1.0%**

Source: GS Research estimates.

We do not believe that the difference in the market expectations for SmartForce and DigitalThink is justified.

First, a common denominator for both SmartForce and DigitalThink is the market's expectation for corporate e-Learning. As SmartForce and DigitalThink both operate exclusively in the corporate e-Learning industry, market expectations for their industry's success must be equivalent.

Next, the market must assess the relative opportunities for wealth creation within corporate e-Learning for both SmartForce and DigitalThink. We find one argument in favor of the market's expectation for DigitalThink to generate higher IRRs than SmartForce: DigitalThink is smaller than SmartForce. There is some credibility to the contention that it is easier to earn higher returns on small capital investments than large ones.

SmartForce's larger size, however, has its benefits. The company occupies the most powerful strategic position within the industry. It has broader product offerings, development, and distribution teams than any other public corporate e-Learning provider. Accordingly, it can generate new revenues and projects at lower costs and with more speed than its competitors. It is also able to sell new projects to a larger client base than its competitors.

This commanding strategic position should overcome, if not more than overwhelm, any benefits accruing to the smaller size of investments required of DigitalThink. We see little reason why SmartForce cannot invest in projects with IRRs that match those of DigitalThink.

We believe that SmartForce is the leading corporate e-Learning provider, and the stock is on our US Recommended List (we rate DigitalThink a Market Performer); we therefore believe that its valuation should reflect its premier position. The market, however, has not placed such a valuation on SmartForce. As our expanded NPV approach indicates, market expectations for SmartForce are lower than those for its corporate e-Learning competitors.

We believe that investors making new commitments to the corporate e-Learning sector face a good entry point in SmartForce: it is a leading Internet company without the accompanying expectations. Until this situation reverses, and expectations for SmartForce match or exceed those for its competitors, we believe that it is the first company investors should consider in the corporate e-Learning sector. On an absolute basis, market expectations for SmartForce are high but not unreasonable, and we see ample opportunity for the company to exceed them going forward.

Corporate training

Corporate training is a $63-billion a year business-to-business (B2B) vertical. The combination of a large, well-defined market, strong competitive advantage, and above-average Porter's ranking make corporate e-Learning our favorite e-Learning sector. Better corporate e-Learning stocks have significantly outperformed the market, and we expect investors to find compelling opportunities within the sector.

Several types of e-Learning corporate training companies already exist, including the following:

- **Technology providers.** Corporate e-Learning is both synchronous and asynchronous, enterprise-wide and user-specific. Technology providers offer the tools and solutions that form the infrastructure to meet varied corporate e-Learning needs.
- **Content providers.** Content providers create the e-Learning courses used to train corporate employees. Content typically falls into one of three baskets: information technology (IT), soft skill, and custom. Leading content providers usually provide services along with their content.
- **Portal providers.** Corporate training portals are usually destination sites for the purchase and deployment of e-Learning.

The corporate training e-Learning market is evolving rapidly, and **the above business models do not do credit to the complexity of existing companies.** In particular, an emerging model is that of the solutions provider.

- **Solutions providers** typically incorporate elements of at least two of the three business models mentioned above. Some solutions providers develop their additional capacities in-house, while others build out their offerings through partnerships.

Existing corporate training e-Learning companies of note are shown in Exhibit 20.

At a glance: Corporate training

Corporate e-Learning is a subset of the corporate training market.

Training magazine estimates that $63 billion in direct costs were spent on corporate training in 1999.

The overall corporate investment in training, which includes direct and indirect costs, was $373 billion in 1999, according to the Employment Policy Foundation.

About 81% of corporations provide formal training and 97% provide informal training, according to the Institute for Research on Higher Education.

IDC estimates that corporations spent $1.1 billion on e-Learning in 1999 and forecasts it to rise at a CAGR of 83% to $11.4 billion through 2003.

Exhibit 20: Selected corporate e-Learning companies

Upstarts

Technology Providers	Portal Providers	Content Providers	
		I.T.	Productivity
Caliber.com	Click2Learn.com	DigitalThink.com	Ninth House.com
Centra.com	CyberU.com	ElementK.com	Pensare.com
Docent.com	Headlight.com	Knowledgenet.com	Skillsoft.com
Eloquent.com	KnowledgePlanet.com	NETg.com	SmartForce.com
Placeware.com	TrainingNet.com	SmartForce.com	Unext.com
Saba.com			UniversityAccess.com

Incumbents

Technology	Professional Services	Instructor-Led Training
Cisco	Arthur Anderson	American Management Association
Dell	Deloitte & Touche	Apollo Group
Hewlett-Packard	Ernst and Young	Community colleges
IBM (Lotus, Mindspan)	kForce	DeVry
Microsoft	KPMG	Global Knowledge Network
Motorola	Manpower	Learning Tree
Oracle	PWC	New Horizons
Sun	Scient	
	Viant	

Note: Upstarts focus only on e-Learning; incumbents are existing companies well-positioned to provide e-Learning.

Source: GS Research.

Topography of corporate e-Learning competition

No single company has emerged as a dominant provider of corporate training. The fragmented nature of corporate America, coupled with the labor intensity of training, has thwarted the rise of dominant instructor led training (ILT) organizations. Among ILTs, there is a growing concern about the rise in e-Learning. In response to e-Learning, ILTs have begun to develop or partner for e-Learning offerings. This trend should continue as e-Learning continues to steal market share from ILTs.

Among incumbents, two of the larger providers of training are IBM and Oracle. Like other large technology organizations, they have historically focused on providing customers, partners, and employees training on their respective product lines. IBM has, however, taken aggressive steps to establish itself as an e-Learning solutions provider; we expect other technology firms to take similar steps. Providers like IBM and other leading technology firms are credible new e-Learning entrants, and they should contribute to increased corporate e-Learning competition.

The ongoing competitive threat to upstarts from incumbents is large, but not overwhelming. Few incumbents possess the content, technology, instructional know-how, brand, and relationships to dominate upstarts. Strong e-Learning growth rates should be more than sufficient to absorb new entrants without triggering price wars during the foreseeable future.

While direct competition between incumbents and upstarts is likely to increase, so are partnerships between the two. Cisco and KPMG are already working closely with e-Learning upstarts, and we expect several more meaningful partnerships to be

announced in the space. Incumbents, with their strong customer relationships and technical know-how can rapidly accelerate the adoption of corporate e-Learning. They in turn look to upstarts for specialized e-Learning content, technology, market awareness, capability, and the like to refine and enhance their offerings. Incumbents present as much of an opportunity as a threat to upstarts.

Direct competition between upstarts exists, but is limited. The two largest upstarts, in revenue terms, are SmartForce and NETg. While these two companies often compete for the same accounts, such head-to-head activity is generally minimal, and many e-Learning companies report facing no e-Learning competition on large contract wins. As e-Learning gains more of a foothold in the corporate training marketplace, buyers will become more aware of the nuances of e-Learning offerings. Their increased awareness will precipitate direct e-Learning competition that does not currently exist.

Competitive trends to watch

Some corporate e-Learning providers will capture more of the e-Learning pie than others. Rather than assess the e-Learning competitive landscape by business model type (technology, content, portal, and solution), investors should consider the industry more holistically (see Exhibit 21).

Exhibit 21: Porter's Five Forces reveals profitable structure of corporate e-Learning
1 = high threat, 10 = low threat

	Corporate e-Learning
Force 1: New Entrants	3
Force 2: Existing Competitors	5
Force 3: Substitutes	8
Force 4: Buyers	6
Force 5: Suppliers	8
Average Score	**6**

Source: Porter's Five Forces, GS Research estimates.

We expect barriers to entry in corporate e-Learning to rise as companies build customer loyalty and increase product differentiation.

All three types of businesses—content, infrastructure, and portals—can earn a large share of the training market, and all three are likely to change significantly before doing so. Common industry trends are shaping the environment in which all corporate e-Learning businesses operate, and providers in this space are working to position themselves to benefit from them.

The race for the CEO's office

Perhaps the most important and long-lasting trend in corporate e-Learning is the race for the CEO's office. All corporate e-Learning providers want to be viewed by their customers' management teams as vital business partners. Today, most training providers are simply vendors to human resource and IT groups. Those e-Learning providers that are able to establish high-level customer relationships will be positioned to earn a disproportionate share of corporate e-Learning dollars.

There are several indicators of success in the race for the CEO's office. Providers performing well in this competition should announce increasingly large revenues from their existing account base. As their offerings assume increased importance at their customers, the uses their products will be put to will vary and increase. Their customers will view e-Learning as an attractive solution to business challenges, and these customers will likely design new and customized uses for their e-Learning solutions.

Competition across e-Learning business models will emerge

As e-Learning providers see their products become more deeply embedded at the customer level, competition across e-Learning business models will likely emerge. This competition will arise because strategic e-Learning partners will use their preferred positions to pursue additional e-Learning revenues. Already, content providers are adding technology to their offerings, and technology providers are structuring their products to capture content revenue.

Solutions build-out will refine the e-Learning value chain

The building out of complete e-Learning solutions will bring greater definition to the e-Learning value chain. e-Learning providers do not yet know how their customers will value content, services, and technology relative to one another. Some providers believe that customers value the ability to manage e-Learning most highly. These providers offer learning management systems to help customers deploy, assess, and procure e-Learning. Other providers believe that customers place the highest value on the learning experience. These providers develop content with a host of learning services, including mentoring, community, and self-publishing tools. While we believe that both visions will be compelling to certain customers, the next few years should bring greater definition to the typical e-Learning value chain.

Adoption of standards will heat up competition within e-Learning

Increased competition within e-Learning will likely be accelerated by the adoption of e-Learning standards. Standards will ensure the interoperability of e-Learning content, services, and technology; without them, e-Learning's growth will be restricted. They will reduce customer reliance on any single, proprietary e-Learning provider. The effect of standards will be to lower barriers to entry, customer switching costs, and differentiation between e-Learning providers.

Solutions providers stand to gain as point providers fight the pressure

All of the above trends will bring particularly high pressure to bear on point providers. Content will likely become increasingly commoditized; singular technology solutions will likely be incorporated within broader technology suites. We believe that only a few, differentiated point providers will survive, providing highly specialized and unique or valuable services.

In place of point offerings, we expect e-Learning providers to either develop or partner to offer e-Learning solutions. These solutions providers should be able to meet all of their customers' e-Learning needs. They will likely offer content, services, and

technology. While no single provider can approach a customer with a complete solution today, many e-Learning firms are taking significant steps in this direction.

As the trends above underscore, corporate e-Learning is at a dynamic stage in its life. Enticed by the large and growing opportunity, providers are emerging rapidly. Although they are all basing their development around particular expectations of how corporate e-Learning will evolve, successful providers down the road are likely to be characterized more by flexibility than insight. They are less likely to accurately predict the major e-Learning evolutions than they are to adapt to them.

Why corporate e-Learning?

Sustainable competitive advantage: More for less

Corporate e-Learning is on the rise due to its sustainable competitive advantage relative to traditional corporate training. We believe that e-Learning can generate more value for corporations and employees than can traditional corporate training:

- **It is rapidly scalable and customizable.** e-learning can scale across the extended enterprise (a corporation, its suppliers, customers, distributors, and other partners) faster and more successfully than can traditional corporate training. Additionally, e-Learning is easily customized to include a corporation's specific content and design.
- **Its quality is consistent and its outcomes are assessable.** e-learning courses offer all employees access to training of a consistent quality. e-learning can be tracked, monitored, and assessed, with the outcomes of e-Learning experiences stored and aggregated at the corporate level.
- **It is more topical and relevant than classroom learning.** e-learning is embracing a just-in-time approach to corporate training. It provides employees with the specific knowledge they need, when they need it. Its content is fresher than classroom curriculum, and can be served in smaller pieces than classroom lectures.
- **It is more convenient than traditional corporate training.** An employee can decide when and where e-Learning should happen; traditional corporate training is not as flexible.
- **Its content and pace can be matched to the learners' preferences.** Classroom training presents all learners with the same content at the same pace. e-Learning is driven by the individual learner's goals and needs. It can be more thorough or more cursory, faster or slower than classroom training—all depending on what the learner desires.

In addition to having net advantages over traditional corporate training, e-Learning is cheaper than traditional corporate training:

- **It requires less direct investment than traditional corporate training.** e-learning requires a digital infrastructure for its creation and deployment. Traditional corporate training relies on a physical infrastructure and is labor intensive. Most

corporations report that the hard cost savings of e-Learning is immediate and compelling.

- **It extracts fewer opportunity costs and indirect costs.** The efficiency of creating and taking e-Learning courses translates into less lost productivity for corporations. It also allows corporations to save on indirect costs like travel and lodging associated with training.

Like all competitive advantages, the sustainable competitive advantage of e-Learning over traditional corporate training stems from a simple attribute: it offers more for less. Corporate e-Learning creates more value, at less cost, for corporations and their extended enterprises than can traditional corporate training. These solid fundamentals should support e-Learning's strong growth for the foreseeable future.

Impediments to rapid adoption

The advantages outlined above represent the compelling reasons underlying the adoption of corporate e-Learning. The advantages of corporate e-Learning are likely to outweigh its impediments, and growth of corporate e-Learning should continue for years to come.

Impediments to its rapid adoption include the following:

- **The discomfort of some learners with technology.** e-Learning is not as familiar as a classroom to some learners. It also fails to capture all of the intangibles of a classroom experience. We expect this difficulty to ebb as e-Learning takes advantage of emerging broadband technologies and gains increasing refinement.
- **The legacy of traditional corporate training.** Most corporations view training as a cost center, and not as a driver of competitive advantage. More often than not, high-level attention to the role of training within the corporation is lacking. Additionally, corporate trainers have vested interests in resisting technologies that may make their jobs obsolete.
- **e-Learning consumes a scarce resource: IT systems and bandwidth.** e-Learning is far more demanding on IT resources than traditional corporate training. The scarcity of IT resources and bandwidth is a constraint on the growth of corporate e-Learning.

Sizing the e-Learning market

The size and evolution of the corporate e-Learning market is unclear due to the following:

- **The rate of substitution from traditional corporate training to e-Learning is unknown.** While we expect this rate to be high, its variability, added to the uncertain size of the corporate training market, thwarts efforts to accurately size the e-Learning market.
- **Corporate e-Learning creates fundamentally new opportunities for corporate training.** Before e-Learning, corporations could not reliably and rapidly train

across their extended enterprises without incurring prohibitive costs. The relative cheapness and ubiquity of e-Learning opens entire new fields for corporate training.

- **Corporate e-Learning further blurs the boundary between higher education and corporate training.** Many people go to school to further their careers; corporate e-Learning can bring school to the workplace. If a full-time employee earns an MBA through a PC at work, are the dollars spent on the degree a higher education revenue or a corporate training revenue?

- **The value and pricing of corporate e-Learning is still emerging.** e-Learning is usually priced at a discount to traditional corporate training. What pricing dynamics will emerge as e-Learning providers compete with one another, and focus less on gaining share from traditional trainers? Additionally, the e-Learning value chain is ill defined. How much more valuable is a solutions provider than a pure content provider?

Investors should not be deterred by the ambiguous size of corporate e-Learning. Indeed as we argue later, the corporate e-Learning opportunity is large enough and likely to be profitable enough to support several meaningful enterprises. The combination of large corporate investments in training and the sustainable competitive advantage of e-Learning over traditional corporate training make us firm believers in the enormous potential of corporate e-Learning.

Telltale sign of the knowledge economy: Human capital investment

Given the difficulties inherent in estimating the dollars spent on corporate training, it is more constructive to examine the issue underlying corporate training: do corporations invest heavily in their human assets?

The indicators of the value that companies place on human capital include (1) the wage differentials paid by firms for different types of human capital, (2) the incidence of training at firms, (3) the creation of the chief knowledge officer, and (4) the rise of the corporate university.

As most of us know, education is a great investment (see Exhibit 22).

Exhibit 22: Companies pay for education and aptitude
ratios

	1991	1992	1993	1994	1995	1996	1997
Grades 9 -11							
Male	0.64	0.68	0.67	0.67	0.74	0.69	0.71
Female	0.64	0.76	0.59	0.58	0.61	0.64	0.63
Bachelor's degree or higher							
Male	1.53	1.6	1.57	1.52	1.55	1.56	1.5
Female	1.9	2	1.99	1.86	1.91	1.88	1.91

Note: Ratio of wages for 25-34 year olds, by highest level of education, to wages of males with a high school or GED degree.

Source: National Center for Education Statistics.

Higher levels of education correlate with higher levels of knowledge and aptitude. It is not difficult to accept that higher levels of education, therefore, closely reflect higher values of human capital. As Exhibit 22 illustrates, then, the more valuable the human capital, the higher the wage it attracts.

Since firms recognize that education can increase the value of human capital, they frequently educate their employees. Hence, the second indicator of the value that companies place on human capital is the incidence of on-the-job training (see Exhibit 23).

Exhibit 23: On-the-job training is nearly universal

Number of Employees	Formal Training	Informal Training
20-49	75%	96%
50-99	82%	99%
100-249	90%	98%
250-999	90%	99%
>1000	99%	98%
All Businesses	81%	97%

Source: Institute for Research on Higher Education.

Exhibits 22 and 23 demonstrate that companies pay more for more valuable human capital, and nearly all of them invest in their existing stock of human capital. Taken together, these indicate a deep and pervasive investment by corporations in human capital.

The creation of the chief knowledge officer (CKO)

Another sign of the corporate investment in human capital is the creation of a new breed of corporate executive, often termed a CKO or chief learning officer (CLO). These professionals, who often sit at the right hand of top-level executives and report to CEOs and management teams, spearhead pedagogical initiatives at firms and design and oversee the architecture of corporate cognition.

The American Society for Training and Development (ASTD) estimates that there are currently more than 250 corporations with CKOs, CLOs, or analogous positions. Although the effectiveness of these executives has yet to be widely proven, it is critical to note that the creation of titles such as these indicate the amount of support for training coming from the highest reaches of the corporate boardroom.

Greater numbers of corporate universities

Another sign of comfort from the CEO's office and a signal in the classification of knowledge is the creation of the corporate university. Corporate University Xchange, a New York City-based corporate education research and consulting firm, estimates that there are more than 1,600 corporate universities in the United States, up from 400 in 1998, and that 40% of Fortune 500 companies have created a corporate university.

Corporate University Xchange estimates the average corporate university budget at $17 million, or 2% of the average organization's payroll.

Direct estimates of corporate e-Learning revenues

Despite the complexity of the task, IDC has estimated the size of the e-Learning market (see Exhibit 24).

Exhibit 24: Corporate e-Learning: A rapidly growing multibillion dollar opportunity?
$ millions

	1998	1999	2000	2001	2002	2003	CAGR
Content	391	735	1333	2270	3912	6164	74%
Learning Services	99	201	533	1216	2418	4109	111%
Delivery Services	61	178	356	567	782	1142	80%
	551	**1114**	**2222**	**4053**	**7112**	**11415**	**83%**

Source: International Data Corporation (IDC).

IDC's e-Learning categories do not map exactly to the e-Learning business models we have discussed. Clearly, content comes from content providers, delivery solutions typically come from technology providers, and learning services usually come from both technology and content providers.

We caution investors against reading any forecast, IDC's included, as a definite predictor of the corporate e-Learning market. As IDC itself notes, "The market did not experience the growth anticipated during the past two years because of limitations associated with course availability, interactivity, and the reluctance of IT departments to dedicate time and resources while Y2K issues were being resolved." Rather, investors should read this forecast as rough indicators of e-Learning's potential.

IDC further splits its forecast for e-Learning by content type into the soft skills/professional development and IT categories (see Exhibit 25).

Exhibit 25: Soft skills to be the principal e-Learning category?
$ millions

	1998	1999	2000	2001	2002	2003	CAGR
I.T. Training	440	870	1660	2700	4059	5307	65%
Soft Skill	110	244	562	1353	3054	6108	123%
	550	**1114**	**2222**	**4053**	**7113**	**11415**	**83%**

Source: IDC.

IDC's general message is that soft skills and professional development training (i.e., productivity) will grow as a percentage of overall e-Learning. While we expect soft-skills trainers to capitalize on the substantial e-Learning opportunity before them, they are currently behind their IT training counterparts in the build-out of e-Learning. Soft-skills trainers have not developed as sophisticated e-Learning offerings, distribution, marketing, or business development capabilities as have IT trainers. In

addition, IT content lends itself more readily to e-Learning than does soft-skill content. We are, therefore, skeptical about the prospects for soft skills to overtake IT training as the primary e-Learning category by 2003.

Revenue forecasts can provide a rough value for the entire corporate e-Learning opportunity, as shown in Exhibit 26.

Exhibit 26: Corporate e-Learning – Potentially worth billions
$ billions

	2000	2001	2002	2003	2004	2005	2006	2007
Industy Revenues	$1,500	$2,100	$2,940	$4,116	$5,762	$8,067	$11,294	$15,812
After-tax operating cash flow	135	189	265	370	519	726	1016	1423
Present value of cash flow	129	162	205	258	325	410	518	653

		Terminal Value Rev. CAGR				
		2.0%	2.5%	3.0%	3.5%	4.0%
Forecast Period Rev. CAGR	30%	6313	6595	6912	7272	7682
	40%	10060	**10533**	**11066**	**11670**	12361
	50%	15698	**16466**	**17330**	**18309**	19428
	60%	23982	**25188**	**26545**	**28083**	29840
	70%	35886	37730	39805	42156	44842

Note: NPV of corporate e-Learning by revenue growth rates.

Source: GS Research estimates.

In the DCF analysis above, we assume a 10% cost of capital, 40% tax rate, and 15% pretax operating margin. The resulting grid conditions the value of corporate e-Learning on revenue growth rates from 2000 to 2007 and then in perpetuity. Depending on the actual growth and operating results of the industry, the entire corporate e-Learning opportunity may already be worth tens of billions of dollars.

Higher education

e-Learning is re-shaping the face of higher education. It has a strong competitive advantage over traditional higher education, and its strong Porter's ranking highlights our enthusiasm for the sector; however, its relative lack of definition underscores its youthfulness. The transformation taking place promises rewarding opportunities for discriminating investors; most of these opportunities, however, are still to come.

Higher education e-Learning companies come in various shapes and sizes. Among the emerging models, the three that are most common include the following:

- **Infrastructure providers.** Higher education lacks the IT, academic, and administrative systems to support e-Learning. Infrastructure providers have designed solutions that enable schools to create on-line courses and administrative functionality for their students.
- **Portal providers.** Higher education portals target distinct student groups with differentiated offerings. Some host e-Commerce sites, others build internal school communities, and others build learning destinations.
- **On-line schools.** Virtual universities are appearing on-line. Some are associated with existing brick-and-mortar institutions, while others have no physical world adjuncts.

As with many businesses, the lines between these e-Learning models are not distinct. For instance, many higher education e-Learning infrastructure providers hope to make money by building portals around their infrastructure offerings.

Some of the more prominent existing higher education e-Learning providers are shown in Exhibit 27.

At a glance: Higher education

According to the National Center for Education Statistics (NCES), there were 4,064 institutions of higher education in the United States in 1997.

About 14.35 million students were enrolled in these institutions.

Total spending at these institutions was $233 billion in 1997.

About 34% of schools offered distance learning in 1997; there were 1.6 million enrollments in the 54,470 courses they offered.

Exhibit 27: Selected higher education e-Learning companies

Upstarts		
Portal Providers	**Infrastructure Providers**	**Online Schools**
Collegeclub.com	Blackboard.com	Capella.edu
Jenzabar.com	Campuspipeline.com	Jonesinternational.edu
MascotNetwork.com	Ecollege.com	Kaplancollege.com
StudentAdvantage.com	Eduprise.com	Online.keller.edu
Youthstream.com	Webct.com	Online.uophx.edu
Incumbents		
Technology	**Publishers**	**Educational institutions**
Cisco	Follett	Business schools
Compaq	Harcourt	Continuing education
Datatel	Houghlin-Mifflin	Correspondence schools
Dell	Pearson	Engineering schools
Gateway	Random House	Law schools
Microsoft		Medical schools
Oracle		
PeopleSoft		
SAP		
SCT		
Sun		

Note: Upstarts focus only on e-Learning; incumbents are existing companies well-positioned to provide e-Learning.

Source: GS Research.

Topography of higher education e-Learning competition

The competitive environment for e-Learning higher education is murky. Generally, e-Learning upstarts and incumbents hope to generate revenues from distance learning, as well as advertising and e-Commerce. There are few e-Learning providers focusing exclusively on the advertising and e-Commerce opportunity, and their competitive positions are better considered on a case-by-case basis than in the abstract.

Distance learning is the only revenue opportunity pursued by upstarts and incumbents alike. Traditional institutions like community colleges court the same group of students as for-profit providers like the University of Phoenix Online. The ability of schools to raise tuition 4%-6% per year, a well-established trend with no clear end, does indicate that overall competition within higher education is minimal. The emergence of a national on-line university is unlikely to drastically alter the competitive landscape of higher education, as the scope of higher education is enormous.

A pressing issue in higher education e-Learning is the nature of the relationship between for-profit providers and traditional higher education institutions. Will partnership or competition be the ultimate dynamic between the two? It is too early for us to provide a convincing answer to this question, but we are comfortable arguing that, regardless of the relationship between companies and traditional institutions, the majority of the profits from higher education e-Learning will flow to for-profit providers:

- **e-Learning providers are highly focused on profitability.** Schools tend not to define their mission around profits. They may be willing to cede profits to e-Learning providers if they earn other, non-monetary benefits from e-Learning. On the other hand, e-Learning providers are likely to be highly attuned to earning profits.

- **e-Learning providers control the scarce resources.** Schools bring content, brand names, and students to e-Learning. No given school controls enough of any of these assets to make them scarce. e-Learning providers bring technology, instructional design, marketing, and other services to e-Learning. Their competencies are in demand, and can scale across most of higher education. If managed correctly, e-Learning providers should be able to translate their position into profits.

- **History favors e-Learning providers.** Schools are constrained by history. Their cultures are often inflexible, and their goals limiting. As the successful rise of for-profit brick-and-mortar education companies like Apollo and Devry has shown that for-profit providers can profitably exploit new opportunities in higher education.

The ultimate level of rivalry between new e-Learning upstarts is also uncertain. This rivalry will directly affect the economic value of e-Learning for investors. Consider distance learning: infrastructure providers may offer distance learning technology to existing schools, portals may establish themselves as distance learning destinations, and on-line schools may build themselves out as stand-alone distance learning providers. What effect will such possible rivalries have on industry profitability? In all likelihood, a couple of dominant higher education e-Learning companies will emerge and capture most of the available value of e-Learning. What models will succeed, and how long they will take to succeed, are the real sources of competitive uncertainty.

What to look for in e-Learning upstarts

For **infrastructure providers**, some of the key variables that will determine success include the following

- **The nature of the relationship between the provider and schools.** The more integrated an infrastructure is across a school, the more valuable its position. First, tight integration translates into high switching costs. Second, it opens up opportunities for new product and service offerings. Successful infrastructure providers will not be viewed by schools as vendors, but as e-Learning partners.

- **The quality of the technology employed.** The infrastructure solution must not only be easy to install and scalable, but must also be user friendly. It must integrate with existing IT infrastructure and comply with IT and emerging e-Learning standards.

- **The number and quality of partnerships formed.** Successful infrastructure providers will monetize their platforms with partnerships. They will offer content and commerce partners access to their school and student bodies. They will acquire useful technologies and reach scale and community as much through partnership as through proprietary solutions.

For **portals**, some meaningful points of differentiation are as follows:

- **The ability to build out a large user base quickly.** Network effects and first-mover advantages are likely to make the race to build e-Learning portals a short one. Attracting users early, and building and growing with them, is a proven recipe for portal success.
- **The provision of value-added services.** Successful e-Learning portals are unlikely to sustain themselves by simply aggregating content. They should build switching costs for suppliers and stickiness for users by providing value-added services to both parties.
- **The formation of partnerships.** e-Learning portals will need to partner with content suppliers, academic and on-line service providers, Web affiliates, and so on. Successful portals should bring new strengths to their sites by forming relationships with best-of-breed partners.

Successful **on-line schools**, be they stand-alone or extensions of existing schools, are likely to focus on some of the following:

- **Developing a strong brand.** Brand and reputation will likely be key attributes that influence on-line schools' customers. An on-line school need not have a reputation for academic excellence to succeed. Rather, brands should be developed to match customers' needs. For example, typical adult learners are far more concerned with the hard dollar return of their education than its intellectual rigor.
- **Perfecting the on-line learning experience.** On-line courses are still in their infancy. Most do not exploit the full capabilities of the Internet, and few providers will be able to afford the costs of creating a rich, immersive, multimedia on-line learning experience. Those that do will appeal to a broad set of learners and will enjoy strong demand for their offerings.
- **Creating an organization focused around service.** On-line learning is often isolating and confusing. To overcome these hurdles, better on-line schools will have large, ever-present support groups. They will assist with technical and academic concerns, and will be critical in maintaining high retention rates at on-line schools.

Higher education e-Learning is a young market with high potential. It is a fragmented industry of sufficient scale to support several substantial enterprises. What the final model of successful providers will be—infrastructure, portal, on-line school, or other—is unclear. Each approach could create a dominant franchise, and success in the industry is likely to be determined at a level lower than grand strategy. Execution of concept, management focus, appropriate capitalization and similar concerns are likely to be the ultimate determinants of success in higher education e-Learning.

Why higher education e-Learning?

Higher education e-Learning companies exist because they can provide compelling value for higher education stakeholders.

The principal end users are students

e-Learning has three sources of competitive advantage relative to traditional higher education:

- **It is more convenient than traditional education.** The Internet lifts two of the largest barriers that impede traditional education: time and distance. Previously, students seeking an education that met their non-traditional geographic and scheduling needs were limited to correspondence courses. Now, they can take qualitatively better courses on-line, with more convenience than correspondence courses. For traditional students, the ubiquity of e-Learning also has advantages over the limited accessibility of classrooms, professors, and libraries.

- **It more effectively delivers only value-added content and services to students.** Traditional education is a bundled good: it comes with lifestyle, instructional style, community, and learning rolled into one. Many students, particularly the growing majority of non-traditional students, receive little (or negative) value from the non-learning aspects of traditional education. e-Learning is not as constrained by these bundled goods, and can be customized to meet an individual student's tastes and needs. Importantly, e-Learning students are less likely to have to pay for services they do not value, such as classrooms and dining halls.

- **It satisfies student demand for on-line experiences.** Higher education students, especially 18-22 year olds, live in a world of e-services and e-communities. They fundamentally expect and enjoy on-line experiences, and their demand for these experiences is a driving force behind the e-Learning initiatives of higher education.

e-Learning companies also benefit teachers and administrators

- **They solve challenging IT problems that confront schools.** Existing higher education IT resources are insufficient to meet the growing demands of their constituents. Most schools lack the personnel and money to develop proprietary IT solutions, and their legacy systems are often incompatible with corporate IT solutions. As schools work to build out rich on-line communities and distance learning offerings, partnering with e-Learning companies is often the only viable choice they have.

- **They help schools fulfill their primary purpose: education.** Common to most schools is a mission centered on education. Today, schools have the ability to address global audiences that reach far beyond their local communities. However, they often lack the technical and marketing expertise to do so. e-Learning companies are working with higher education institutions to alleviate these problems. They offer solutions that enable schools to do more of what they do best: teach.

- **They present schools with new revenue opportunities.** Schools have not captured a large share of their students' e-Commerce dollars. As e-Learning companies bring

e-Commerce and advertisements to a school's intranet, schools will share in the value generated.

- **They help schools attract and retain students.** Increasingly, students are adding computer and Internet facilities to their decision criteria for evaluating schools. Rankings of schools now incorporate measures of these facilities, too. To remain competitive, schools need to develop their computing and Internet infrastructures.

Cost advantages over traditional education

It is difficult to comment on the cost advantages of higher education e-Learning relative to traditional higher education, but some observations are possible:

- **For many e-Learning companies, cost comparisons can only be made to other e-Learning providers.** Web-based courses, on-line student communities, infrastructure solutions, and others face limited non e-Learning competition. They are new businesses made possible by the potential of the Internet. Even when traditional competitors do exist, as in the case of classroom courses verse Web-based courses, they often serve different target markets than e-Learning providers.

- **On-line courses should enjoy cost advantages over classroom courses.** Currently, on-line course providers report operating margins similar to that of classroom operators. This data, however, is somewhat misleading. First, on-line operators likely have lower capital requirements than brick-and-mortar institutions. Second, and more importantly, the on-line model is still evolving, and despite limited learning curve benefits, is already cost competitive with brick-and-mortar services.

- **e-Learning providers are as likely to partner with higher education institutions as to compete with them.** In the case of partnership, competitive advantage is unlikely to be driven by cost advantages. Rather, it will spring from the congruity of resources and strategies between traditional and e-Learning higher education providers.

Some barriers remain

While e-Learning brings cost and value advantages to higher education, there are some impediments to its progress:

- **Traditional institutions of higher education resist the encroachment of e-Learning.** Colleges and universities are remarkably resistant to change; their form and function today closely resemble that of hundreds of years ago. Internal constraints, including tenure systems and the need to maintain exclusivity, hamper the adoption of e-Learning by many leading schools. Schools fear the uncertain role they play in a world of e-Learning and wish to maintain as much control over the education process as possible.

- **Uncertain business models restrain the advance of e-Learning into higher education.** Higher education e-Learning providers are still searching for paying customers for their services. Schools often lack the resources to pay for e-Learning services, so the relationships between them and e-Learning companies are evolving.

Some schools offer e-Learning companies access to their student bodies, while others enter into revenue sharing agreements for e-Learning services.

- **Technology limits the quality of higher education on-line learning.** Broadband access is scarce in today's world, and many students find learning over a computer frustrating. As the quality of connectivity improves and e-Learning companies are able to offer more immersive, communal experiences, e-Learning should gain more traction in higher education.

- **Accreditation requirements for distance learning are still vague.** Accreditation is the hallmark of a quality higher education institution. Without it, schools are ineligible for federal financial aid dollars. While on-line schools have gained accreditation, the criteria for their accreditation are evolving. The uncertainty surrounding criteria for accreditation has probably slowed the formation of on-line schools.

The benefits and cost advantages that higher education e-Learning enjoys relative to traditional higher education fuel its competitive advantage. This competitive advantage should be sufficient to overcome the relatively transient barriers to its adoption. The lack of definition of higher education e-Learning, however, makes the timing and size of its adoption relatively unclear.

Sizing the higher education e-Learning opportunity

Despite these constraints, e-Learning is gaining a toehold in higher education. The size of the opportunity addressed by higher education e-Learning companies can be measured in both operating and economic terms.

Leading indicators of revenue potential

Common operating trends are creating economic opportunities for all three types of higher education e-Learning companies (infrastructure, portal, and on-line schools). Generally, these trends all reflect the shift of student activities away from the physical world to the Internet. Be they traditional or adult learners, students are spending an increasing amount of time working, communicating, and interacting on-line. For this reason, we explore the operating opportunities for all three business models jointly.

The operating opportunity of higher education e-Learning is largely a function of two variables: the number of schools and students in the United States and the adoption of the Internet by schools and students (see Exhibit 28).

Exhibit 28: Higher education—A stable and enormous market

	1994	1995	1996	1997	1998	1999
Schools (a)		3,706	4,009	4,064		
Students (thousands)	14,279	14,262	14,300	14,350	14,590	14,758
Spending ($ billions 1997)	$218	$223	$229	$233		

(a) Schools are degree granting & Title IV eligible.

Source: National Center for Education Statistics.

As the numbers in Exhibit 28 illustrate, higher education serves a significant portion of the US population with a relatively fixed base of assets. The spending does not include the consumer spending of higher education students.

A useful indicator of the higher education e-Learning operating opportunity is Internet usage among traditional college students (see Exhibit 29).

Exhibit 29: Heavy Internet usage is almost universal on college campuses

Percent of students using the Internet:	90%		
Frequency of Connection	Total	Male	Female
More Than Daily	41%	45%	36%
Once A Day	25%	23%	27%
Every Few Days	23%	22%	25%
Less Often	11%	10%	12%
Hours Online Per Week	1999	1998	1997
Total	7.2	5.6	5.5
Male	8.5	6.1	6.5
Female	6	5	4.4

Note: Sample of 1,200 students, representative of 5.3 million full-time undergraduate students.

Source: Student Monitor LLC.

While high levels of Internet activity among college students is not surprising, how they spend their on-line time is more revealing (see Exhibit 30).

Exhibit 30: Students use the Web for functionality and community

Activity	Most important reason to use the internet	Percent of students doing activity in past month
E-mail	63%	74%
Research	39%	48%
Hobby	21%	38%
Web Site	**Site visited this year**	**Site visited most often**
Yahoo!	82%	41%
AOL	54%	18%
Excite	40%	5%

Note: Sample of 1,200 students, representative of 5.3 million full-time undergraduate students.

Source: Student Monitor LLC.

Despite images to the contrary, the average student is not spending on-line hours downloading music and playing games. Students use the Web to communicate and to work. Importantly, the statistics offer a snapshot of a trend. We believe that students will increasingly turn to the Web for e-Commerce, but those infrastructure providers and portals looking to attract students should focus on school work and community first, and e-Commerce second.

Exhibits 29 and 30 tell us that students use the Web heavily for work and communal experiences, and that the school market is a natural environment for e-Learning providers to build out communities.

What makes this natural environment a compelling option is that a school's intranet is an obvious gateway for students to access the Web (see Exhibit 31).

Exhibit 31: Intranet is as popular as AOL and Yahoo! for Web access and e-mail

Web Site / Service	Used for internet access	Used for e-mail
AOL	50%	25%
Campus network	**44%**	**26%**
Yahoo!	36%	8%

Note: Sample of 1,200 students, representative of 5.3 million full-time undergraduate students.

Source: Student Monitor LLC.

Those e-Learning providers that gain access to a school's intranet will instantly command a leading presence with higher education students. This strong showing is largely a result of a few simple facts: First, computer labs are a popular means of Internet access for students and, by default, these labs are part of a school's intranet. Second, access to local school content and resources tends to be offered via a school's intranet. Third, off-campus students often dial into campus intranets for general Internet access.

With the appropriate infrastructure, school intranets can grow into more than just a school home page. They may tie the data embedded in enterprise resource planning (ERP) systems into functional Web front ends, as part of a broader, customized e-Learning solution for each individual student. These customized learning portals could be filled with content from student courses, favorite Web sites, and university administration files. Millions of students might rely on this infrastructure for their daily Web activities, including homework, e-Commerce, communicating, and community building. This operating opportunity should be compelling to schools, e-Learning companies, and investors alike.

Distance learning trends augur large e-Learning opportunity

Exhibit 32 indicates that the distance learning market is already large.

Exhibit 32: Distance learning has a deep base within higher education

Total number of institutions	Offered DL in 1997	Plan to add DL within 3 yrs.	No DL or DL plans
5,010	34%	20%	47%

Total enrollments (thousands)	Undergraduate enrollments	Graduate and professional enrollments	Other enrollments
1,661	1,082	281	298

Total number of courses	Undergraduate courses	Graduate and professional courses	Other courses
54,470	35,550	14,140	4,780

Note: Data are for the 1997-1998 academic year.

Source: National Center for Education Statistics.

Distance learning is a compelling opportunity for e-Learning companies because the Internet is already transforming it (see Exhibit 33).

Exhibit 33: The Internet is the most popular means of delivery for distance learning

	Interactive audio & video	Pre-recorded video	Asynchronous internet	Synchronous internet	CD-ROM
Percent of DL institutions using	54%	47%	58%	19%	7%

Note: Schools using distance learning report on their current instructional technology.

Source: National Center for Education Statistics.

The Internet's strong position within higher education distance learning should only grow (see Exhibit 34).

Exhibit 34: The Internet should become the dominant platform for distance learning

	Increase	Decrease	Unchanged	Will not use
Asynchronous internet	82%	0%	1%	16%
Synchronous internet	60%	<.5%	1%	39%
Interactive video	61%	1%	4%	34%
Pre-recorded video	35%	1%	11%	54%
CD-ROM	31%	0%	1%	69%

Notes: Schools using distance learning report on their plans for the next three years.

Source: National Center for Education Statistics.

The only instructional technology that might keep pace with the Internet is interactive video. As broadband capabilities spread across the Internet, we expect interactive video courses to also shift to Web-based delivery.

As the Internet plays an increasingly larger role in distance learning, schools will naturally turn to e-Learning companies for distance learning technology solutions. Some will partner with e-Learning companies, others will be customers of e-Learning companies, and others will compete directly with on-line schools operated by e-Learning companies.

The bottom line: Higher education e-Learning could be worth billions

The operating trends give rise to compelling economic opportunities for higher education e-Learning companies. Broadly speaking, higher education e-Learning companies may generate revenues from three sources: distance learning, advertising, and e-Commerce.

Distance learning is a valuable higher education e-Learning market

At a high level, it is not difficult to accept that distance learning is potentially worth billions in new wealth for investors. After all, on-line corporate training companies like SmartForce and DigitalThink are already worth billions. Additionally, the market has already valued the distance learning components of Apollo and Devry. Apollo, whose University of Phoenix Online division has approximately 13,000 students, has announced that it plans to issue a tracking stock that would place an initial value on that division of $375-$750 million.

The distance learning opportunity can be roughly sized without comparison to existing businesses. We have already provided some operating statistics, like course enrollments, which reflect the operating size of distance education. To value the distance learning opportunity, we first need to know how much revenue those courses represent (see Exhibit 35).

Exhibit 35: Schools charge the same tuition for distance and traditional learning

	Same	More	Less	Varies
All institutions	77%	6%	3%	14%

Source: National Center for Education Statistics.

Schools neither pass on extra costs nor cost savings from distance learning to their students. Working with this pricing scheme, we can estimate the total tuition dollars spent on distance learning during the 1997-1998 academic year.

One complicating factor to this approach is that distance learning data reflects enrollments, while overall higher education data reflects students. Equating enrollments and students as equivalent is only valid so long as distance learning students are enrolled in only one distance learning course. Unfortunately, there is no clear data about the average course load of distance learning students. A full-time student usually

takes eight courses during the academic year; a part-time student usually takes between one and seven. Without much insight into this issue, we assume that the average distance learning student is enrolled in four courses a year.

Dividing total distance learning course enrollments of 1.661 million by four yields a total distance learning student body of 415,000 students during the 1997-1998 academic year. We can now estimate a rough level of distance e-Learning revenues (see Exhibit 36).

Exhibit 36: e-Learning distance could create billions in revenues

	1998	1999	2000	2001	2002	CAGR
Distance learning students (thousands)	415	519	649	811	1,014	25%
% of DL that is e-Learning	30%	35%	40%	45%	50%	14%
DL e-Learning students (thousands)	125	182	260	365	507	42%
Tuition per full-time student (nominal)						
Public -2 yr.	$1,318	$1,371	$1,426	$1,483	$1,542	4%
Public - 4 yr.	3,110	3,234	3,364	3,498	3,638	4%
Private - 4 yr.	13,392	13,928	14,485	15,064	15,667	4%
Scaling factor for part-time DL assumption: (4/8)	50%	50%	50%	50%	50%	
Total e-Learning DL tuition ($ thousands)						
Public -2 yr.	$35,579	$53,961	$80,171	$117,250	$169,361	
Public - 4 yr.	83,623	126,828	188,430	275,579	398,058	
Private - 4 yr.	112,555	170,708	253,623	370,924	535,779	
	$231,756	**$351,497**	**$522,224**	**$763,752**	**$1,103,198**	**48%**

Source: National Center for Education Statistics, GS Research estimates.

Like other valuation estimates in this report, the distance e-Learning revenue numbers are not a forecast of expected revenues, but just a guide for a valuation exercise.

Since distance e-Learning is likely to grow rapidly for years to come, we need revenue estimates further into the future to place a rough value on it (see Exhibit 37).

Exhibit 37: e-Learning DCF yields a multibillion dollar opportunity
$ millions

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Distance Learning Revenue	$1,103	$1,379	$1,724	$2,155	$2,693	$3,367	$4,208	$5,260	$6,576
After-tax operating cash flow	99	124	155	194	242	303	379	473	592
Present value of cash flow	77	86	97	109	123	139	156	176	198
Terminal Value (12X '10 OCF)									7102
NPV of Distance Learning	**$3,537**								

Note: Forecast assumes revenue CAGR of 25%, operating margin of 15%, cost of capital of 11%, and a tax rate of 40%.

Source: GS Research estimates.

In our DCF analysis, we assume an 11% cost of capital, 25% growth rate, 15% operating margin, and 3% growth in perpetuity. These results seem conservative

relative to other Internet valuations, as they value distance e-Learning companies at 2.6X 2001 revenues.

While distance e-Learning is a large market opportunity, few private companies currently profit from it. **The overwhelming majority of distance e-Learning is currently provided by two- and four-year public colleges and universities**. These schools not only provide most of the distance learning; they also charge low prices for their offerings. For-profit providers of distance e-Learning face two challenges: First, they must compete with well-established public schools for distance learning students; second, they must generate sufficient value above and beyond what is generated by public institutions to raise the price charged for distance learning.

Distance learning companies are likely to compete successfully with and charge more for their product than public colleges and universities. The successful emergence of for-profit brick-and-mortar higher education providers like Apollo and Devry illustrates the ability of the private sector to operate profitably in higher education. The same qualities that help these companies thrive—a compelling value proposition, focused management, and slow-moving incumbent competition—should propel better distance learning companies to success. Further, as the ability of companies like Apollo and Devry to charge premium tuition relative to public colleges indicates, students are willing to pay more for an education that they believe delivers more value.

Advertising and e-Commerce: How large can they grow?

Advertising and e-Commerce represent an enormous opportunity for e-Learning. They are perfect examples of the importance of partnerships between traditional institutions and for-profit providers. Their potential value directly hinges on how tightly integrated e-Learning providers become with school intranets.

If an e-Learning portal has to compete with Yahoo!, America Online (AOL), and the rest of the Internet to attract students, then it is in a difficult situation. It faces the prospects of high customer acquisition costs and the need for national advertising to build out a large user base. If, however, such a portal is able to leapfrog over general Internet offerings by tying into a school's intranet, then it has instantly built out a national audience with relatively little marketing.

Schools will decide whether or not e-Learning providers will be allowed to offer e-Commerce and advertising via their intranets. Ultimately, we believe they will permit such offerings for the following reasons:

- **Of the two currencies, many schools will prefer granting access to spending dollars.** Presented with the option, many schools will opt to save dollars and pay for e-Learning by permitting e-Commerce and ads on their intranets.
- **Schools can generate revenue and goodwill with e-Learning cum e-Commerce.** Increasingly, schools will realize that if they do not market to their students, their students will visit other sites that do. By bringing e-Commerce to their intranets, schools can provide students with services they desire as well as capture some of the value that would otherwise have gone to Amazon.com and others.

- **e-Learning e-Commerce will offend fewer people as time passes.** First, e-Learning providers will learn to tailor their e-Commerce to schools' sensitivities. Second, schools' sensitivities will change as e-Commerce and advertising become as common on-line as they are off-line. Today, schools are not upset by corporate sponsors advertising on their campuses or by corporations profiting off their bookstores. Gradually, they will view their intranets as just another part of their campuses and treat them accordingly.

In the long run, we do not believe that schools will pass up the opportunity to share in the monetization of their students' on-line activity. Still, most schools have not yet reached this point. Therefore, investors should discount e-Learning e-Commerce and advertising that depend on a school's intranet more heavily than e-Commerce and advertising that are generated without a school's complicity. In the long run, though, e-Learning e-Commerce generated through intranets should be more valuable than regular e-Commerce because of the low customer acquisition and retention costs of that approach.

Advertising and e-Commerce potential: A rough guide

The value of e-Commerce and advertising opportunities are typically measured by three factors: unique visitors, page views, and session lengths. What these three metrics try to describe is the number and depth of relationships a Web site has with its customers. With a few assumptions, we can roughly model potential unique users and viewing time for the entire higher education e-Learning industry. Exhibit 38 indicates the potential size and depth of relationships between students and e-Learning providers. Given the early stage of higher education e-Learning, these numbers should not be read as a forecast, but as a rough guide to the sector's potential.

Exhibit 38: e-Learning can attract millions of students without high penetration

	Total online students						
	2000	2001	2002	2003	2004	2005	2006
College students (thousands)	14,889	14,992	15,053	15,185	15,349	15,516	15,703
Percent of students online	90%	91%	92%	93%	94%	95%	96%
Students online (thousands)	13,400	13,643	13,849	14,122	14,428	14,740	15,075
	e-Learning market penetration						
	Percent market share						
	2000	2001	2002	2003	2004	2005	2006
Low	5%	6%	7%	8%	9%	10%	11%
	6%	8%	9%	11%	12%	14%	15%
Medium	7%	11%	14%	18%	21%	25%	28%
	8%	14%	19%	25%	30%	36%	41%
High	9%	17%	24%	32%	39%	47%	54%
	e-Learning Unique Visitors						
Low	670	819	969	1130	1299	1474	1658
	804	1023	1246	1483	1731	1990	2261
Medium	938	1432	1939	2471	3030	3611	4221
	1072	1842	2631	3460	4328	5233	6181
High	1206	2251	3324	4448	5627	6854	8140

Source: National Center for Education Statistics, Student Monitor, Media Metrix, GS Research estimates.

These market penetration numbers do not reflect students who use the Internet as part of a requirement for a class; we expect most students to choose or be required to use the Internet as part of their studies. Rather, they reflect the population that might be reached by e-Commerce and advertising from e-Learning providers.

In addition to sizing the potential visitors for e-Learning sites, investors need to know how much time those visitors might spend on e-Learning sites. We provide some analysis on this issue in Exhibit 39.

Exhibit 39: With low penetration, e-Learning could still attract more student hours
hours on-line per student

	2000	2001	2002	2003	2004	2005	2006
Hours online per month	30	33	35	38	41	43	46
	Percent of online hours spent on e-Learning sites						
Low	0.0%	0.8%	1.7%	2.5%	3.3%	4.2%	5.0%
	0.3%	1.7%	3.1%	4.5%	5.9%	7.3%	8.8%
Medium	0.5%	2.5%	4.5%	6.5%	8.5%	10.5%	12.5%
	0.8%	3.3%	5.9%	8.5%	11.1%	13.7%	16.3%
High	1.0%	4.2%	7.3%	10.5%	13.7%	16.8%	20.0%
	Hours per month spent on e-Learning sites						
Low	0.0	0.3	0.6	1.0	1.4	1.8	2.3
	0.1	0.5	1.1	1.7	2.4	3.2	4.0
Medium	0.2	0.8	1.6	2.5	3.4	4.5	5.7
	0.2	1.1	2.1	3.2	4.5	5.9	7.4
High	0.3	1.4	2.6	4.0	5.5	7.3	9.1

Source: GS Research estimates, Media Metrix.

As with the other exhibits in this valuation exercise, the numbers above should not be interpreted as a forecast. Actual e-Learning student hours where e-Commerce and ads are available will likely be substantially different to the scenario above. What the scenario illustrates is that e-Learning e-Commerce and ads can gain significant exposure to students without e-Learning having to be a large part of overall student on-line time.

Not only can higher education e-Learning attract hours a month of advertising and e-Commerce time from millions of college and university students, but e-Learning customers are also likely to be particularly valuable customers:

- **Traditional college students are sought after by advertisers.** College students make many consumer decisions for the first time in their lives. They establish brand loyalties and purchasing habits in college that follow them for life. For this reason, advertisers value college students highly.
- **Traditional 18-22 year old students tend to belong to society's wealthiest classes.** Education pays large dividends, and those that pursue it tend to come from middle and upper class backgrounds. As such, students tend to have larger disposable incomes than their non-student peers. This makes them highly valuable to advertisers and e-Commerce providers.
- **e-Learning students will tend to be heavier Web users than other Internet users.** e-Learning alone will make e-Learning customers heavy Web users. This heavy use translates into comfort with the Web, and, accordingly, advertising and e-Commerce.

e-Learning customers do present some challenges to e-Commerce and advertising providers:

- **Their e-Learning experience will be less commercial than the Web at large.** e-Learning customers are paying for access to an e-Learning environment that is

focused on learning, first and foremost. Their e-Learning experiences will be more directed than those of a typical Web surfer, and the academic environment that they populate is necessarily less commercial than the Internet in general.

- **Savvy e-Learning customers will not respond well to average advertising and e-Commerce.** Sophisticated Web users, a group to which e-Learning customers belong, will require sophisticated marketing and e-Commerce. e-Learning customers understand what the Web at large has to offer, and are likely to be harder customers to satisfy than average Internet users.

Taken as a whole, e-Learning customers are a highly valuable target market for advertising and e-Commerce providers, despite the challenges they present to these companies.

Based on its potential for unique users and viewing time, we can try to value higher education e-Learning. Using publicly traded portals and content providers as comparables, we assessed what multiples higher education e-Learning might trade at relative to its user base and their on-line viewing time (see Exhibit 40).

Exhibit 40: Higher education advertising and e-Commerce is large but uncertain
$ millions

		Value Based On Year 2002 Unique Visitors				
	Visitors	969	1,246	1,939	2,631	3,324
Multiple						
0.1		$97	$125	$194	$263	$332
0.3		291	374	582	789	997
0.5		485	623	969	1,316	1,662
0.7		679	872	1,357	1,842	2,327

		Value Based On Year 2002 Minutes Per Month				
	Visitors	35	66	96	126	156
Multiple						
50		$1,774	$3,282	$4,791	$6,299	$7,807
100		3,549	6,565	9,581	12,598	15,614
150		5,323	9,847	14,372	18,896	23,421
200		7,097	13,130	19,163	25,195	31,228

Note: Spread In values reflect lack of consistent public valuation metrics for portals and content providers.

Source: GS Research estimates, FactSet Research Systems, Inc., Media Metrix.

Unfortunately, no clear message is discernible from publicly traded comparables. The wide spread in market multiples for publicly traded firms hampers our effort to more tightly value higher education e-Learning. In the end, this exercise confirms our belief that higher education e-Learning advertising and e-Commerce is a meaningful opportunity, but the exercise cannot help us define it crisply.

K-12

e-Learning promises to change the way American schoolchildren learn. As the industry continues to gain definition, its competitive advantage over traditional education and strong Porter's ranking should create several profitable opportunities for investors.

Within K-12, e-Learning companies have emerged in three primary forms:

- **Portal providers**, which build on-line communities of students, parents, teachers, and administrators. They offer this community content and services that are focused around the goals of education.
- **Content providers**, which deliver digital content, often software to students, parents, teachers, and administrators. These providers sell to schools and homes, and offer products that aim to meet educational needs.
- **Infrastructure providers**, which supply the digital backbone for K-12 e-Learning. They offer communication suites, e-procurement solutions, educational assessment tools, and others targeted toward teachers and administrators.

As K-12 e-Learning emerges, the business models within it have shifted. A particularly common practice is for software vendors to re-invent themselves as portal providers. Under this new guise, they work to migrate their software customers to their Web sites and deepen their relationship with their customers.

K-12 e-Learning providers are appearing daily, and are actively competing in a nascent market. Within the group of existing providers, some companies of note are shown in Exhibit 41.

At a glance: K-12

According to the National Center for Education Statistics:

America spent $351 billion on K-12 education in 1997.

More than 75% of K-12 funds come from state and local governments.

About 52.7 million students, representing more than 19% of the population, attended K-12 schools in the fall of 1998.

About 92% of K-12 students attended public schools in the fall of 1998.

Public schools employed 2.7 million teachers in the fall of 1997, resulting in an average student-teacher ratio of 16.8.

Exhibit 41: Selected K-12 e-Learning competitors

Upstarts

Portal Providers	Content Providers	Infrastructure
Bigchalk.com	AdvantageLearning.com	iMind.com
ClassroomConnect.com	Apex.com	NCS.com
Copernicus (EdGate.com)	Bigchalk.com	Netschools.com
Family Education Network (Fen.com)	Computer Curriculum Corp. (ccclearn.com)	nSchool.com
Lightspan.com	Lightspan.com	Powerschool.com
ZapMe.com	Riverdeep.com	Schoolcenter.com
	ScientificLearning.com	SchoolCity.com
	SmarterKids.com	Thinkwave.com
		wwwrrr.com

Incumbents

Technology	Publishers	Miscellaneous
Apple	Follett	AOL
Compaq	Harcourt	Kaplan
Dell	Houghlin-Mifflin	Princeton Review
Gateway	Pearson	School Specialty
IBM	Primedia	Sylvan
Microsoft	Random House	Yahoo!
Sun	Scholastic	

Note: Upstarts focus only on e-Learning; incumbents are existing companies well-positioned to provide e-Learning.

Source: GS Research estimates.

K-12 e-Learning's competitive environment is the most undeveloped of all three e-Learning sectors. Competition between upstarts is virtually non-existent, as these companies are small players in a relatively massive market. More menacing is the potential for e-Learning competition from incumbents. Pearson and AOL have been particularly active in K-12 e-Learning, and we continue to expect incumbents with content, technology, or K-12 distribution relationships to enter this market.

Why K-12 e-Learning?

Given the current state of K-12 e-Learning, the first question many investors ask is, "Why K-12 e-Learning at all?" As with any industry being transformed by the Internet, the answer to this question is driven by the Internet's ability to generate competitive advantage for companies employing it.

e-Learning must satisfy students

The first group of K-12 stakeholders that e-Learning must satisfy is students. Without the approval and enthusiasm of students, K-12 e-Learning offerings will never occupy a position of value in education. The principal desire of students is to learn as much as possible in as little time and with as little discomfort as possible. K-12 e-Learning meets students' goals in four primary ways:

- **It is personalized.** e-Learning offerings are customizable to each student's particular needs and learning style. They help the student assess weaknesses and may lead to content that can improve understanding.

- **Its presentation is engaging.** e-Learning companies can invest heavily in the design and presentation of their products. Unlike other educational providers, they can take advantage of multimedia tools that school children appreciate.

- **It is Web-delivered and designed.** Studies of student behavior reveal that students are spending more time on the Web and less time in front of the television. Putting education where the students are, on-line, in an environment they enjoy, attracts them.

- **It makes work easier to do.** Instead of relying on local libraries and museums like traditional education does, e-Learning allows students to access a world of search engines and Web pages. The Internet is a fantastic medium to store and share information, which enables e-Learning companies to take some of the pain out of schoolwork.

Teachers propel the move to e-Learning

Students, of course, participate in e-Learning not only because they might want to, but because they might be required to. **Teachers drive students to e-Learning.** They do so out of a belief that it meets their interests as educators:

- **It prepares students for a wired world.** Educators are under increasing pressure to provide students with technical savvy. Central to this mission is ensuring that students are computer and Web literate. Given the uncontrolled nature of the Web, many teachers are uncomfortable introducing unfiltered content to their classes. By relying on e-Learning providers, they are assured that their students are gaining technical skills in an intellectually rewarding, non-threatening environment.

- **It helps teachers teach.** Used as learning aides, e-Learning enables teachers to spend their time more effectively on each student's weakness. While one student learns from an e-Learning tool, another benefits from one-on-one attention from a teacher, who helps that student with problems that an e-Learning program has identified.

- **It makes the school a safer place to teach and learn.** e-Learning portals bridge the gap between parent and teacher. They allow the teacher to effectively communicate to groups of parents publicly, and to particular parents in private. The communities established in these portals can protect the schools that students and teachers live and work in.

Parents look to e-Learning to help their kids

The third and final group of stakeholders that K-12 e-Learning benefits is parents. **Parents turn to e-Learning because it helps them help their children.** The main benefits that parents realize from e-Learning are listed as follows:

- **An increased awareness of their children's performance and behavior at school.** e-Learning allows parents to examine their children's attendance, grades, and records. They can monitor homework requirements and understand what their children should be learning and capable of at any given point in time. All of this

knowledge sharing takes place in an e-Learning portal, populated with information direct from schools' IT systems and classrooms.

- **An understanding of what steps they can take to assist their children.** Parents are willing to devote time and money to help their children. When it comes to school, they often do not know how to put their resources to their children's best benefit. e-Learning providers can assist parents in this area, with automatic and customized suggestions, as can teachers in e-Learning portals. On-line tutoring and customized content will be available for parents looking to help their children.

Cost benefits of e-Learning are clear but hard to measure

The ability for e-Learning to produce major value for the main K-12 stakeholders is large. The costs of doing so relative to traditional educational providers have not been explored in detail, for a few reasons:

- **Often, e-Learning competes only with e-Learning.** For instance, there is no cost comparison to be made between e-Learning's ability to prepare students for a wired world and another medium's ability to do so, because e-Learning is necessarily the only choice to meet this need.
- **Second, the cost benefits of electronic content are generally accepted.** Typically, delivering content over the Web is cheaper and more efficient than doing so in books and other media.
- **Finally, there is no generic K-12 e-Learning cost structure.** For example, two e-Learning companies may each offer schools complete computer lab solutions. One pays for and charges hard dollars for its products; the other receives its products from sponsors for free, and requires schools to promote these sponsors to schoolchildren. The analysis of these e-Learning providers' cost structures clearly depends on which of the companies that concern us.

Industries enjoy competitive advantages when they are able to generate more value at lower cost for their customers than their competitors. We believe that K-12 e-Learning benefits from competitive advantages over traditional education.

Impediments to K-12 e-Learning

Any analysis of the benefits of K-12 e-Learning is not complete without a discussion of its shortcomings. e-Learning is quick to raise the temperature of many professional educators, and key among its oft-cited deficiencies are the following:

- **Inappropriateness for technologically challenged teachers.** The schoolhouse is not as technologically sophisticated as most corporations, and teachers are not as technologically capable as most corporate employees. Relying on them to incorporate technology into their lesson plans is often impractical and unrealistic, given their environment and know-how.
- **Blindness to issues of equity.** The digital divide separates today's rich and poor. By layering e-Learning over this inequitable structure, society only further disadvantages those that most need equal access to education.

- **Infancy and unproven results**. Is e-Learning the latest fad to hit education? Should schools be getting back to basics, spending dollars to ensure basic literacy and citizenship skills, rather than acquiring computers, software, and Internet subscriptions?

While these criticisms of K-12 e-Learning are not without merit, they are unlikely to stop its development. Indeed, as the size of K-12 e-Learning illustrates, the industry has already taken firm roots.

Leading indicators of the K-12 e-Learning opportunity

Recall that there are three primary business models in K-12 e-Learning: portal, content, and infrastructure providers. Operating metrics for portal providers include unique visitors, page views, and average session length. Unfortunately, K-12 portals are so young (and often private), that few meaningful statistics are available. So, the operating size of K-12 portals are best measured not as they stand today, but in terms of the market awaiting them.

A useful indicator of this opportunity is the size of the on-line K-12 population; this population accesses the Web both from home and school. Trends for connectivity from school are healthy, fueled in no small part by the federal E-rate program. This program earmarks billions of dollars for wiring schools for the Internet. These trends are detailed in Exhibit 42.

Exhibit 42: K-12 public school Internet access is nearly universal

	Percent of public schools with Internet access				Percent of instructional rooms with Internet access				Students per instructional computer with Internet access	
	1994	1996	1998	**1999**	1994	1996	1998	**1999**	1998	**1999**
All public schools	35%	65%	89%	**95%**	3%	14%	51%	**63%**	12	**9**

Source: National Center for Education Statistics.

In 1999, there were nine instructional computers with Internet access per public school K-12 student in the country. If current trends continue, virtually all classrooms should be connected to the Internet over the next few years.

Along with access from school, K-12 students can access the Internet from home and public facilities, like their local library. Connectivity trends for homes are positive, with most homes now having a connection to the Internet (see Exhibit 43).

Exhibit 43: The majority of American schoolchildren are on-line at home

Internet use of kids ages 8-17	
E-mail only	21%
Other Internet (with or without e-mail)	**74%**
Neither	6%

Source: Annenberg Public Policy Center.

Home connectivity is not only improving in quantity, but in quality. An increasing number of homes are opting for broadband connections to the Internet, a trend that is bolstered by new product rollouts from telecom and cable companies.

Connectivity is only a first-level approximation of the addressable opportunity for K-12 portals. The important question for portals is, "Will students with connections spend their on-line time doing school work?" We think they will, for a few reasons.

First, students already devote significant time to homework in the off-line world (see Exhibit 44).

Exhibit 44: Homework hours are a large e-Learning opportunity

Hours Per Day	4th Graders	8th Graders	11th Graders
None	29%	29%	37%
< 1 hr.	52%	36%	26%
1-2 hrs.	15%	25%	25%
> 2 hrs.	5%	9%	12%

Source: National Center for Education Statistics.

Given that students already spend time doing homework and spend time on-line, then they will likely do their homework on-line, especially because e-Learning holds substantial inherent attraction for K-12 students relative to traditional learning. Given a choice between learning and e-Learning, we believe that many students will opt for e-Learning.

Second, college students, who are more sophisticated at getting what they need from the Internet than are elementary school students, have turned to the Internet in large numbers to complete assignments. As e-Learning companies provide tools that make the Internet easier for K-12 students to use, we expect more K-12 students to move on-line, following the example of college students.

In addition to the pull from students for e-Learning, there is a real push toward it from schools. The school connectivity trends are but one indicator of how serious schools are about incorporating the Internet into the classroom. Underpinning this pull has been the multibillion dollar federal E-rate program. E-rate, which subsidizes the cost of technology for schools, is part of a goal set forward by President Clinton to have every classroom connected to the Internet by the year 2000. Initiatives such as E-rate are representative of the broad acceptance of technology at schools. States are increasingly adopting technology literacy requirements for high school graduates, and teacher training in the use of classroom technology is on the rise. While it is hard to quantify the effects of this shift toward technology, the implication of its depth and national scope are clear: K-12 e-Learning companies face a golden opportunity to assume a position of prominence in America's classrooms.

Billion-dollar revenue opportunities

If K-12 students do indeed turn to e-Learning portals and generate large operations at them, then substantial economic value will be generated for the owners of these portals.

Generally, Web portals generate revenues from three streams: advertisements, e-Commerce, and e-services. Estimating the potential of these revenue streams for all K-12 e-Learning portals with accuracy is improbable, but the exercise is telling.

The first stream of revenues that portals may attract derive from e-services. These services include the provision of content, tutoring, teacher training, and distance learning. Proprietary content dollars will come from schools and homes alike. For schools, content revenue streams can come from the three sources detailed in Exhibit 45.

Exhibit 45: School spending is a growing opportunity for portals
$ millions

	1999	2000	2001	2002	2003	CAGR
Supplementary Print Materials	$1,441	$1,585	$1,744	$1,918	$2,110	10.0%
Software	444	533	639	770	932	20.4%
Online Services	118	143	175	215	265	22.5%
Total	**$2,003**	**$2,261**	**$2,558**	**$2,903**	**$3,307**	**13.4%**

Source: GS Research estimates, Education Market Research, IDC.

Excluded from these revenue streams are textbook dollars, because portal content is unlikely to replace textbooks in the foreseeable future. Clearly, portals are not likely to garner 100% share of the addressable school content market. So, the content opportunity for portals must be scaled by some market share assumptions (see Exhibit 46).

Exhibit 46: Portals should gain an increasing share of the school content market
revenues; $ millions

Market Share	1999	2000	2001	2002	2003
5%	$100	$113	$128	$145	$165
10%	200	226	256	290	331
15%	300	339	384	435	496
20%	401	452	512	581	661
25%	501	565	640	726	827

Source: GS Research estimates.

The point of Exhibit 46 is not to make an accurate prediction about portal content revenues, but to provide some color for an order-of-magnitude calculation. Portals are likely to grow in the school market by taking share away from traditional content providers. As shown by the staircase of boxes in Exhibit 44, this share shift should occur gradually.

Outside the schoolhouse, the home is another market for portal content. Dollars that parents typically spend on games, books, software, and entertainment are potential revenue streams for portal content. Measuring this opportunity is a difficult task. First, how much parent spending in these categories is education related? Of those dollars that are education related, how quickly will they shift to on-line media? We have no complete answer to this question, but do believe that the home market opportunity for

K-12 e-Learning is substantial. In 1997 alone, parents spent $985 million on educational software, as estimated by Packaged Facts.

One way to size the home market for portal content is in comparison to the demand for portal content from schools, as shown in Exhibit 47. This exhibit takes the revenues from Exhibit 46 (those representing school content market share gains by portals) and sizes the home content market as multiples of them.

Exhibit 47: The home market for portal content should grow vs. the school market
revenues; $ millions

Multiple	1999	2000	2001	2002	2003
.25X	$25	$57	$96	$145	$207
.5X	50	113	192	290	413
1X	100	226	384	581	827
1.5X	150	339	576	871	1240
2X	200	452	767	1161	1654

Source: GS Research estimates.

Again, the purpose of Exhibit 47 is not to present a certain forecast of home content revenues for portals, but to provide a rough gauge of its potential. As portal content gains share in schools, home content use should accelerate relative to school use. The dynamic behind this shift in relative revenue contribution from home and school is the lag between the adoption of academic products in the school and home. As teachers adopt portal content for classroom use, they will likely recommend it to parents, who will likely bring portal content into their homes. Ultimately, the home market may grow to be larger than the school market. The final size of the home market relative to the school market is highly uncertain, as the multiple boxes around 2003 home content revenues in Exhibit 47 indicate.

We can now combine estimates for home and school portal content revenues to produce an overall forecast for portal content revenues (see Exhibit 48).

Exhibit 48: Total portal content revenues could grow dramatically
revenues; $ millions

Revenue	1999	2000	2001	2002	2003
Low Penetration	$125	$170	$224	$290	$372
	250	339	448	581	744
Medium Penetration	401	565	767	1016	1323
	551	791	1087	1451	1902
High Penetration	701	1018	1407	1887	2481

Source: GS Research estimates.

Based on this exercise, K-12 e-Learning portals might reasonably expect to generate large revenues from content sales. We now need to determine how valuable those revenue streams are. There are two methods that yield answers to this question. The first relies on simple price-to-sales (P/S) multiples (see Exhibit 49).

Exhibit 49: K-12 portal content worth billions by traditional Internet valuation metric
industry value; $ millions

2001 P /S Multiple	Low Revenue	Medium Revenue		High Revenue	
5X	$1,119	$2,238	$3,837	$5,436	$7,035
7.5X	1679	**3358**	**5756**	**8154**	10552
10X	2238	**4477**	**7674**	**10872**	14070
12.5X	2798	**5596**	**9593**	**13590**	17587
15X	3358	6715	11511	16308	21104

Source: GS Research estimates.

The 2001 P/S multiple range used in Exhibit 49 is broadly representative of the values conferred on media portals by the market. The 2001 sales range to which the multiples are applied are taken from Exhibit 48. By such a metric, K-12 portal content is a significant, untapped investment opportunity.

Another way to measure the value of K-12 e-Learning portal content is to estimate the cash flows it will generate, and to discount these future values back to a present value. Exhibit 50 gives a rough DCF estimate of the value of portal content, which begins in 2003, one of the first years portals are likely to generate cash flow from content sales:

Exhibit 50: DCF confirms multibillion-dollar opportunity for K-12 portal content
industry value; $ millions

	2003	2004	2005	2006	2007	2008	2009	2010
Industry Revenue	$992	$1,290	$1,677	$2,180	$2,834	$3,684	$4,789	$6,226
After-tax operating cash flow	89	116	151	196	255	332	431	560
Present value of cash flow	62	73	85	99	116	136	160	187
Terminal Value								2245
Net present value	**$3,163**							

Note: Forecast assumes revenue CAGR of 30%, operating margin of 15%, cost of capital of 11%, and a tax rate of 40%.

Source: GS Research estimates.

We assume 11% cost of capital, 30% top-line growth past 2003, 15% operating margin, 40% tax rate, and 3% perpetuity growth rate for the terminal value. Also, we use the medium penetration revenue assumption from Exhibit 46. While this DCF has flaws, adjusting for them would not change the fundamental message: K-12 portal content can create billions of dollars of value for investors.

Recall that the provision of content is just one of several K-12 portals e-services. Other possible services include tutoring, teacher training, and distance learning. E-services, in turn, are just one of several possible K-12 portal revenue streams. Other revenue streams may be generated by advertising and e-Commerce operations. As with content, valuing these opportunities with high certainty is unlikely. Rather than estimate them directly, investors can instead look at non e-Learning portals for some guidance on these opportunities. We can examine the relative sizes of non e-Learning portals' revenue streams to understand how portals have evolved (see Exhibit 51).

As Exhibit 51 details, Internet portals have succeeded in developing multiple revenue streams to monetize their communities. Typically, these non-core revenue streams grow in relative size as time passes, reflecting a fundamental lesson for all portals: develop a focused product to attract customers first, and then roll out various services to those customers after a core community has been established.

Exhibit 51: Non e-Learning portals have grown multiple revenue streams
common size revenues broken down by revenue stream's contribution

AOL	1998	1999
Total Service Revs.	72%	68%
Advertising/E-commerce/Other	28%	32%

Lycos	1998	1999
Advertising	71%	68%
E-commerce/License/Other	29%	32%

Expedia	1998	1999
Agency	63%	65%
Advertising and other	37%	35%

iVillage	1997	1998
Advertising	100%	83%
E-Commerce	0%	17%

Source: GS Research estimates.

If we extrapolate from the experiences of non e-Learning portals to K-12 e-Learning portals, we can place a range on the size of the non-content revenue opportunities for K-12 e-Learning portals. In the short run, these opportunities should represent 20%-40% of total revenues. Assuming these revenue streams are as valuable as content revenue streams, they should increase the potential value of portals by a similar 20%-40%.

In the long run, the non-content opportunity is probably worth more than 20%-40% of the content opportunity, for a few reasons. First, public portals are still evolving, and the general trend is toward the diversification of revenue streams. Second, if K-12 e-Learning portals do build a deep community of students, parents and teachers, they will have the opportunity to monetize each of these three distinct audiences. Finally, as broadband reaches the general population, the prospects for distance learning, tutoring, and teacher training within a K-12 portal are substantial.

An observation on non-portal content providers

Another main K-12 e-Learning business model is that of non-portal content providers. These companies sell electronic content and software to the home and school market. They will either compete with or partner with portals for a share of the content opportunity already explored. Additionally, they may address some market opportunities that portals are unlikely to pursue. For instance, their solutions may gain higher levels of adoption within the classroom as electronic teacher aides. Or, they may replace textbooks in certain subjects. Overall, however, any content provider working to realize a large share of the K-12 opportunity will have to expand beyond the simple delivery of content. The points of value for content providers are the relationships they build with students, teachers, and parents. Simply using those relationships to deliver content does not maximize their value. So, the more aggressive content providers will likely develop portals of their own, working to extract more value out of their customer

relationships. This process is already occurring, and we expect it to continue for the foreseeable future.

An observation on infrastructure providers

It is challenging to make general observations on the market opportunity before infrastructure providers. These companies sell a wide range of infrastructure solutions, each of which has its own particular market potential. For instance, the revenue opportunity for e-procurement infrastructure providers is substantially different for that of communication suite providers. For this reason, we shy away from estimating a general infrastructure market opportunity and instead evaluate business prospects on a case-by-case basis for K-12 e-Learning infrastructure providers.

Overall, the potential for K-12 e-Learning portal, content, and infrastructure providers is substantial. What we hope our valuation exercise details is the potential for significant wealth creation from all of K-12 e-Learning. At this stage in the industry's evolution, most of those operations and value lie uncreated. Still, investors should warm to the real potential in this space and carefully analyze the prospects of all companies aiming to serve it.

Who wins the e-Learning portal race?

While the prospect for meaningful wealth creation does exist in K-12 e-Learning, investors will want to know which companies are most likely to create that wealth. A clear lesson that Internet investors have learned is that disproportionate gains accrue to the leaders in any given space. **It is too early to identify the leading portal and content providers.** Still, there are some indicators of success that investors should watch closely.

- **Successful portal providers will likely pursue the triangle of students, parents, and teachers.** Combined, this community represents nearly 110 million people, and touches most of us at multiple points in our lives. Building the richest, deepest community possible is the challenge that all portals face, and K-12 portals that ignore one or more vertices of this triangle do so at their own risk. Their offerings will not be as compelling or inviting to whatever community they do serve if they exclude one or more of these audiences. Successful portals will attract and retain each of these audiences.

- **First-mover advantages are often the only advantages needed.** Network effects accumulate more rapidly in Internet communities than perhaps any other business. Capable management teams in other areas of the Internet have translated first-mover advantages into relatively unassailable positions of dominance. The mandate of portal providers is to build audiences first, and profits second.

- **Academic integrity will decide the day.** Teacher buy-in is the grease that will keep the K-12 portal engine thriving. Teachers control learning (and e-Learning) in the classroom, and, to a large extent, out of the classroom. Their decisions directly drive the behavior of millions of students, and can cement a given educational product in the class and home. Parents trust what teachers recommend, and will have their children abide by teacher recommendations in the home, just as they do in the class.

K-12 portals are in their early days. Still, in a world that moves at Internet speed, investors should soon gain insight into which companies are ahead. Portals that achieve the three points detailed above should be among the leaders in the space.

Who wins the e-Learning content race?

Dominant content providers will likely pursue a different path of ascendancy than portals. Some of the keys to their success are as follows:

- **Best-of-breed technology.** As the market for K-12 e-Learning content becomes increasingly sophisticated, buyers will likely cast a careful eye on the technology embedded in product offerings. First and foremost, they will likely focus on the soundness of the instructional design of their content solutions. Coupled with superior instructional design, they will likely seek products that engage students. Finally, these products must be easy to deploy and scale across the home and school.

- **Keen attention to the sales effort.** The current state of K-12 e-Learning content solutions is characterized by some confusion. Multiple vendors target teachers and schools that are accustomed to a highly structured purchasing process. Additionally, teachers often lack the technical skill to assess competing e-Learning products. Vendors need to educate schools on their offerings, and should differentiate from competitors on the strength of their sales force.

- **A reputation for service.** Content providers that ease the installation and use of their products with strong customer service will likely distinguish themselves with customers. This focus on service should begin with the installation process and carry through to teacher training on product use.

The market for e-Learning content providers is young, and the keys to success provided above are borrowed from lessons learned by software providers in other industries. More specific points of differentiation for K-12 e-Learning content providers should emerge as the market matures.

DigitalThink (DTHK)

DigitalThink is a leading "born on the web" corporate e-Learning solutions provider offering content, services, and technology across the extended enterprises of Fortune 1000 clients. DigitalThink's custom-development capacity and systems integrator relationships are critical components of the company's strategic positioning.

Company data	
Market Performer	
Small-Cap Growth	
Price: $52.00	
S&P 500: 1464	
United States	

Stock data	
52-week range	$59.44-$18.00
Yield	—

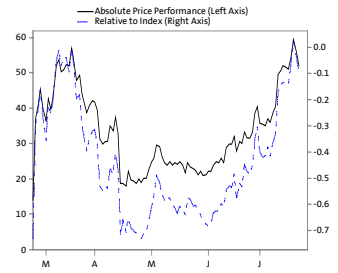
Capitalization	
Market cap	$1,763mn
Latest net debt/(cash)	—
Free float	—
Derivatives	—
Shares outstanding	33.9mn

Price performance	1M	3M	12M
Absolute	65%	175%	—
Rel to S&P 500	63%	173%	—

Priced at market close of July 24, 2000.

Forecasts/valuation	2001E	2002E
EPS	-$0.68	-$0.31
P/S	56.2X	30.9X

Price performance chart



We have initiated coverage of DigitalThink with a Market Performer rating. The company offers superior customized corporate e-Learning products; however, strong industry growth and company fundamentals are moderated by above-average valuation and risk.

- **DigitalThink's compelling e-Learning solution positions it for ongoing success.** The company's powerful combination of content, services, and technology place it among a small group of corporate e-Learning solution providers. The strategic value of its solution should increase as corporate e-Learning matures.
- **Development and distribution are key sources of differentiation.** DigitalThink's custom-development capacity and systems integrator relationships are critical components of the company's strategic positioning.
- **Strong industry fundamentals should support robust growth.** Corporate training is a $63-billion B2B opportunity, and corporate e-Learning has sustainable competitive advantage over traditional corporate training.
- **DigitalThink's current valuation is above average** and reveals high market expectations for sequential revenue growth, future profit margins, and new sources of revenue generation.
- **DigitalThink's operations are relatively young** (the company was founded in 1996), and its ongoing development may not always proceed predictably. However, its business model can generate high levels of profitability, and we see little risk of financial distress at the company.

Valuation

We employ two valuation approaches to DigitalThink stock: a price-to-sales (P/S) approach and our favored expanded NPV analysis. DigitalThink currently trades at 56.2X fiscal 2001 sales. This multiple details high market expectations for the company and is above the median multiple of a basket of comparable stocks. Although

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we consider the P/S multiple inadequate for valuing DigitalThink for a number of reasons, our preferred expanded NPV analysis confirms the intuition of the P/S multiple. It reveals market expectations for DigitalThink to earn IRRs ranging from 14% to 40% on future projects. While these returns may be achievable, they nonetheless illustrate a high level of market enthusiasm for the stock. The current valuation is rich.

Key risks

As a young and rapidly growing company, DigitalThink presents investors with the opportunity for both high reward and risk. Five key risks for DigitalThink are (1) exposure to key customers, (2) emerging business model, (3) newness to hyper-growth, (4) youth of corporate e-Learning, and (5) rich valuation.

Financials

We forecast fiscal (March) 2001 revenues of $31.4 million and fiscal 2002 revenues of $57.0 million; we forecast losses of 68¢ and 31¢, for the same periods. While we estimate breakeven around the fourth quarter of 2002, it could occur earlier. Our EPS estimates exclude all non-cash stock compensation and EDS warrant charges. DigitalThink reported revenues of $6.3 million and a loss of 18¢ per share for the first (June) fiscal 2001 quarter. The company recognizes revenue from two sources: learning solutions services and delivered learning. Learning solutions contributed $3.9 million and delivered learning contributed $2.4 million of revenues to the quarter's strong results. A large share of the company's relatively heavy content R&D expenditure of $2.8 million was attributable to its GE contract, and should not be viewed as a sign of rising costs at DigitalThink. We do expect increased technology R&D expenditures for the year, as the company now employs 25 more people due to its acquisition of Arista Knowledge Systems; the Arista acquisition provides DigitalThink with enhanced Learning Management System (LMS) functionality and a larger pool of in-house technologists.

Learning solutions revenue is recognized on a percentage-of-completion basis. Working with DigitalThink salespeople, learning solutions clients identify their e-Learning requirements. They then translate these requirements into a custom-course development plan. DigitalThink is paid on an installment basis as it reaches the planned milestones in the course development plan. In turn, revenue is recognized as payments are made. It can typically take DigitalThink between 3 and 24 months to complete a learning solutions contract.

Delivered learning customers purchase entitlements to a fixed number of courses from DigitalThink. These entitlements typically last for a year and, once activated, grant a learner access to a course for up to six months. Once a course is begun, DigitalThink recognizes revenue from it ratably over the course's 6-month life. If a customer does not use all of its entitlements over its contract period, then it forfeits its entitlements without recompense. Since a customer may begin a course at the end of a typical 12-month contract, and this course may last for up to 6 months, DigitalThink may recognize revenue from 12-month delivered learning contracts for up to 18 months.

Exhibit 52: DigitalThink earnings model

$ thousands, except per-share data; March fiscal year-end

	2000	Q1A 06/30/00	Q2E 09/30/00	Q3E 12/31/00	Q4E 03/31/01	2001	Q1E 06/30/01	Q2E 09/30/01	Q3E 12/31/01	Q4E 03/31/02	2002
Revenues											
Delivered Learning fees	$4,994	$2,395	$2,730	$3,113	$3,548	$11,786	$4,133	$4,815	$5,609	$6,534	$21,091
Sequential change		24%	14%	14%	14%		16%	16%	16%	16%	
Year-over-year change	383%	423%	175%	94%	83%	136%	73%	76%	80%	84%	79%
Learning Solution services	5821	3867	4486	5203	6036	19592	7031	8191	9541	11115	35878
Sequential change		62%	16%	16%	16%		16%	16%	16%	16%	
Year-over-year change	616%	440%	292%	231%	153%	237%	82%	83%	83%	84%	83%
Total Revenues	**$10,815**	**$6,262**	**$7,216**	**$8,316**	**$9,584**	**$31,378**	**$11,165**	**$13,006**	**$15,150**	**$17,649**	**$56,970**
Sequential change		45%	15%	15%	15%		16%	16%	16%	16%	
Year-over-year change	486%	433%	238%	162%	121%	190%	78%	80%	82%	84%	82%
Costs and Expenses											
Delivered Learning Gross Expenses	2,409	1,012	1,147	1,276	1,419	4,854	1,571	1,733	1,907	1,994	7,205
DL Gross Profit	2585	1383	1584	1836	2129	6932	2563	3082	3702	4540	13887
Gross Margin	52%	58%	58%	59%	60%	59%	62%	64%	66%	69%	66%
Learning Solution Gross Expenses	3,337	2,281	2,557	2,862	3,199	10,899	3,516	3,932	4,389	4,725	16,561
LS Gross Profit	2484	1586	1929	2342	2837	8693	3516	4259	5152	6390	19317
Gross Margin	43%	41%	43%	45%	47%	44%	50%	52%	54%	57%	54%
Total Gross Expenses	5,746	3,293	3,704	4,138	4,618	15,753	5,086	5,665	6,296	6,718	23,766
Gross Profit	5069	2969	3512	4178	4966	15625	6078	7341	8854	10930	33204
Gross Margin	47%	47%	49%	50%	52%	50%	54%	56%	58%	62%	58%
Content R&D	4,082	2,820	2,100	2,200	2,300	9,420	2,000	2,000	2,000	2,000	8,000
Percent of Revenues	38%	45%	29%	26%	24%	30%	18%	15%	13%	11%	14%
Technology R&D	3,687	2,142	3,000	3,200	3,300	11,642	3,400	3,400	3,400	3,400	13,600
Percent of Revenues	34%	34%	42%	38%	34%	37%	30%	26%	22%	13%	24%
Total R&D	7,769	4,962	5,100	5,400	5,600	21,062	5,400	5,400	5,400	5,400	21,600
Percent of Revenues	72%	79%	71%	65%	58%	67%	48%	42%	36%	31%	38%
Sales & Marketing	11,596	3,921	4,000	4,100	4,200	16,221	4,200	4,200	4,300	4,300	17,000
Percent of Revenues	107%	63%	55%	49%	44%	52%	38%	32%	28%	24%	30%
General & Administrative	2,342	1,174	1,200	1,300	1,300	4,974	1,400	1,400	1,500	1,500	5,800
Percent of Revenues	22%	19%	17%	16%	22%	16%	13%	11%	10%	8%	10%
Depreciation & Amortization	915	562	600	600	700	2,462	800	900	1,000	1,000	3,700
Percent of Revenues	8%	9%	8%	7%	7%	8%	7%	7%	7%	6%	6%
Avg. Useful Life	0					0					0
Stock-based compensation	3,663	1,549	1,500	1,000	800	4,849	500	500	500	500	2,000
Percent of Revenues	73%	25%	21%	12%	8%	15%	4%	4%	3%	3%	4%
Percent of Net (excl. Stock Comp.)	22%	25%	16%	11%	9%	14%	6%	7%	9%	13%	8%
Operating Costs and Expenses	$26,285	$12,168	$12,400	$12,400	$12,600	$49,568	$12,300	$12,400	$12,700	$12,700	$50,100
Operating Income	(21,216)	(9,199)	(8,888)	(8,222)	(7,634)	(33,943)	(6,222)	(5,059)	(3,846)	(1,770)	(16,896)
Margin	-196%	-147%	-123%	-99%	-80%	-108%	-56%	-39%	-25%	-10%	-30%
Sequential change		-16%	3%	7%	7%		19%	19%	24%	54%	
Year-over-year change	-259%	-273%	-125%	-20%	4%	-60%	32%		53%	77%	50%
Interest and Other Income	1,055	1,549	1,400	1,300	1,200	5,449	1,100	1,000	900	800	3,800
Percent of Revenues	10%	25%	19%	16%	13%	17%	10%	8%	6%	5%	7%
Percent of Net Income	5%	20%		13%	12%	14%	13%	14%	14%	19%	14%
EDS Warrant Expense			3,333	3,333	3,333	10,000	3,333	3,333	3,333	3,333	13,333
Net Profit (loss)	($20,161)	($7,650)	($10,821)	($10,255)	($9,767)	($38,494)	($8,455)	($7,393)	($6,279)	($4,303)	($26,429)
Margin	-186%	-122%	-150%	-123%	-102%	-123%	-76%	-57%	-41%	-24%	-46%
Sequential change		-6%	-41%	5%	5%		13%	13%	15%	31%	
Year-over-year change	-251%	-222%	-179%	-53%	-35%	-91%	-11%		39%	56%	31%
Net Inc. Excl. Stock Comp. & Warrant Expenses	(16,498)	(6,101)	(5,988)	(5,922)	(5,634)	(23,645)	(4,622)	(3,559)	(2,446)	(470)	(11,096)
Cash Earnings	(15,583)	(5,539)	(5,388)	(5,322)	(4,934)	(21,183)	(3,822)	(2,659)	(1,446)	530	(7,396)
Accretion of preferred stock											
Basic Shares Outstanding											
Weighted Avg.	25,412	33,867	34,363	34,738	35,113	34,550	35,488	35,863	36,238	36,613	36,050
End of Period		34,175	34,550	34,925	35,300	35,300	35,675	36,050	36,425	36,800	36,800
Diluted Shares Outstanding											
EPS	(0.79)	(0.23)	(0.31)	(0.30)	(0.28)	(1.11)	(0.24)	(0.21)	(0.17)	(0.12)	(0.74)
EPS Excl. Stock Comp. & Warrant Expenses	**($0.65)**	**($0.18)**	**($0.17)**	**($0.17)**	**($0.16)**	**($0.68)**	**($0.13)**	**($0.10)**	**($0.07)**	**($0.01)**	**($0.31)**

Source: Company data, GS Research estimates.

Saba Software (SABA)

Saba offers an Internet-based software platform and related services to enable organizations to procure and deliver learning across their extended enterprises. The company also offers an Internet-based marketing and distribution channel for content providers; tools to efficiently manage demand for training and content development; and the Saba Learning Exchange, a B2B marketplace aligning corporate buyers with providers of learning content.

Company data	
Market Outperformer	
Small-Cap Growth	
Price: $19.50	
S&P 500: 1464	
United States	

Stock data	
52-week range	$33.00-$13.50
Yield	—

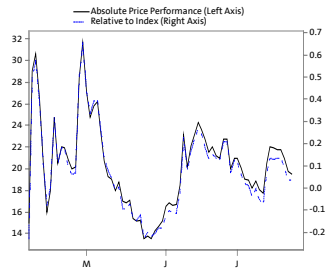
Capitalization	
Market cap	$756mn
Latest net debt/(cash)	—
Free float	—
Derivatives	—
Shares outstanding	38.8mn

Price performance	1M	3M	12M
Absolute	-7%	-11%	—
Rel to S&P 500	-9%	-14%	—

Priced at market close of July 24, 2000.

Forecasts/valuation	2001E	2002E
EPS	-$1.52	-$0.47
P/S	17.4X	7.6X

Price performance chart



The Internet is at the heart of the forces reshaping corporate learning. Historically, the learning processes within organizations have been inefficient and costly. The Internet, as a new communication medium, is transforming the corporate learning market. Saba's Internet-based platform and related services transform the way enterprises manage the learning process and bring buyers and sellers of learning together. We rate the stock a Market Outperformer.

- **Compelling benefits to both organizations and learning providers.** Saba's offerings are designed to cost-effectively meet the needs of both organizations and learning providers. Organizations implementing Saba's solutions can efficiently target, deploy, and manage the learning process. It also enables learning providers to develop, market, sell, deliver, and improve their learning offerings.

- **Saba Learning Network.** Saba Learning Network is an Internet-based software application that allows enterprises to assess the learning needs of individuals and organizations, select and deploy internal learning content, purchase online and off-line learning materials and programs, track individual learners' progress, and manage enterprise-wide learning initiatives.

- **Saba Learning Provider Network.** Saba Learning Provider Network is an Internet-based software application that enables learning providers to develop, market, sell, and distribute on-line and off-line learning materials to organizations worldwide.

- **Saba Learning Exchange.** Saba Learning Exchange is an Internet-based B2B learning content marketplace. The Saba Learning Exchange is designed to enable businesses, governments and learning providers to buy and sell learning offerings, such as on-line and off-line courses and related materials, as well as collaborate within learning communities. Saba Learning Exchange has broad functionality, including
  - search capability for the thousands of publicly available offerings by competence, certification, role, industry, geography, language, provider, and delivery method;
  - access to private learning networks and offerings via secure pass codes;

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  - community features such as chat rooms and discussion groups for buyers, users and providers of learning solutions; and
  - e-Commerce capabilities.

- **Large and impressive customer list as well as strong partnerships.** Saba has over 63 customers and 40 alliance partners. As of May 31, 2000, over 2.8 million people licensed Saba's software for use and 30,000 third-party learning content offerings were accessible on Saba learning networks

Valuation: Trading at a discount to its comp group

We believe that the best comparable companies to Saba are Niku, Agile Software, Freemarkets, Ariba, CommerceOne, SmartForce, and DigitalThink. The comparable companies trade on average at 44X and 23X estimated 2000 and 2001 calendar revenues, respectively. Saba trades at 25.0X and 11.5X our calendar revenue estimates, respectively, a moderate discount to its comparable group. As Saba continues to demonstrate strong growth and solid execution over the next several quarters, the shares could trade at a higher multiple.

Key risk: Rapidly evolving markets

Saba was founded in April 1997, shipped its first products in April 1998, and began to operate Saba Learning Exchange in December 1999. Because Saba has a limited operating history, investors should consider and evaluate the company's prospects in light of risks and uncertainties frequently encountered by early stage companies in rapidly evolving markets.

Financials: License revenues highly visible

Saba reported strong fiscal (May) 2000 fourth quarter results with total revenues of $7.8 million, above our $6.8-million estimate. The cash loss of 33¢ per share beat our loss estimate of 40¢ and the Street loss estimate of 42¢. Our revenue estimates for fiscal 2001 and 2002 are $43.5 million and $100.0 million, respectively, and our cash loss estimates are $1.52 per share and 47¢. We estimate that the company will break even in the fourth fiscal quarter of 2002. Currently, license and services revenues constitute the majority of total revenue. Saba has adopted a conservative revenue recognition policy, in which it recognizes license revenue ratably over 12 months. As a result, license revenue for future quarters are highly visible and management indicated that over 90% of license revenue for the next fiscal quarter has already been achieved with deferred revenue and license contracts signed to date.

Exhibit 53: Saba Software earnings model
$ millions, except per-share data; May fiscal year-end

	Fiscal 2001E				Fiscal 2002-E				Fiscal Years		
	Aug	Nov	Feb	May	Aug	Nov	Feb	May	2000	2001-E	2002-E
Revenues											
License	$4.1	$5.1	$6.1	$7.8	$9.4	$11.2	$13.2	$15.2	$7.9	$23.1	$49.0
Services	$3.9	$4.3	$4.6	$5.0	$5.7	$6.7	$7.8	$9.4	$10.1	17.7	$29.6
Internet Services	$0.1	$0.1	$0.8	$1.8	$2.6	$4.0	$6.0	$8.9	---	2.7	$21.4
Total revenue	**$8.0**	**$9.5**	**$11.5**	**$14.5**	**$17.7**	**$21.9**	**$27.0**	**$33.4**	**$18.0**	**43.5**	**$100.0**
Cost of goods											
License	$0.1	$0.2	$0.2	$0.3	$0.3	$0.3	$0.3	$0.3	$0.0	$0.7	$1.2
% of license	2.3%	3.0%	3.3%	3.5%	2.7%	2.8%	2.5%	2.3%	0.5%	3.2%	2.5%
Services	3.5	3.5	3.7	3.8	3.8	4.2	4.6	5.2	$9.0	$14.6	$17.8
% of services	91.2%	82.5%	80.6%	77.3%	65.9%	62.6%	58.7%	55.8%	89.0%	82.5%	60.1%
Internet Services	0.0	0.0	0.2	0.4	0.5	0.8	1.2	1.8	---	$0.5	$4.3
% of services	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	NA	20.0%	20.0%
Sub-total COGS	$3.6	$3.7	$4.1	$4.5	$4.5	$5.3	$6.1	$7.3	$9.1	$15.9	$23.3
Gross profit	4.4	5.8	7.4	10.0	13.2	16.6	20.9	26.1	$8.9	$27.6	$76.7
Gross Margin	54.5%	61.2%	64.5%	69.2%	74.3%	75.8%	77.4%	78.0%	49.7%	63.5%	76.7%
R&D	5.87	6.23	6.27	6.44	6.42	6.31	6.65	6.79	$15.8	$24.8	$26.2
S&M	13.68	14.45	15.18	16.05	15.34	15.12	15.60	15.67	$26.9	$59.4	$61.7
G&A	3.43	3.48	3.52	3.42	3.45	3.47	3.55	3.57	$6.4	$13.8	$14.0
Amortization of deferred stock compensation	4.8	4.3	3.1	2.3	2.0	1.6	1.4	1.1	$15.3	$14.6	$6.1
Total oper. exp.	$27.8	$28.5	$28.0	$28.2	$27.2	$26.6	$27.2	$27.2	$64.4	$112.6	$108.0
Operating income	($23.4)	($22.7)	($20.6)	($18.2)	($14.0)	($10.0)	($6.3)	($1.1)	($55.5)	($84.9)	($31.3)
Oper. margin	-292.7%	-239.0%	-179.4%	-125.5%	-79.2%	-45.4%	-23.2%	-3.3%	-308.5%	-195.3%	-31.3%
Other inc (exp)	0.7	0.7	0.5	0.3	0.3	0.2	0.2	0.2	$1.0	$2.2	$0.9
Pretax income	($22.7)	($22.0)	($20.1)	($17.9)	($13.7)	($9.7)	($6.1)	($0.9)	($54.5)	($82.7)	($30.4)
Pretax margin	-283.6%	-231.9%	-175.1%	-123.1%	-77.5%	-44.3%	-22.6%	-2.7%	-302.8%	-190.1%	-30.4%
Taxes											
Tax rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Net income	($22.7)	($22.0)	($20.1)	($17.9)	($13.7)	($9.7)	($6.1)	($0.9)	($54.5)	($82.7)	($30.4)
EPS (a)	**($0.53)**	**($0.50)**	**($0.45)**	**($0.38)**	**($0.28)**	**($0.19)**	**($0.12)**	**($0.02)**	**($1.66)**	**($1.85)**	**($0.59)**
(a) includes amoritization and acquisitions costs											
Basic Shares Outstanding	42.9	44.1	45.1	46.8	48.6	50.8	53.0	55.7	32.7	44.7	52.0
Diluted Shares Outstanding	48.4	49.6	50.6	52.3	54.1	56.3	58.5	61.2	38.8	50.2	57.5
Excluding Amortization of Acquisition costs and Goodwill											
Total oper. exp.	$23.0	$24.2	$25.0	$25.9	$25.2	$24.9	$25.8	$26.0	$49.1	$98.0	$101.9
Operating income	($18.6)	($18.4)	($17.6)	($15.9)	($12.1)	($8.3)	($4.9)	$0.0	($40.2)	($70.4)	($25.2)
Oper. margin	-233%	-193%	-153%	-109%	-68%	-38%	-18%	0%	-223%	-162%	-25%
Other inc (exp)	$0.7	$0.7	$0.5	$0.3	$0.3	$0.2	$0.2	$0.2	$1.0	$2.2	$0.9
Pretax income	($17.9)	($17.7)	($17.1)	($15.5)	($11.8)	($8.1)	($4.7)	$0.2	($39.2)	($68.2)	($24.3)
Pretax margin	-223.6%	-186.1%	-148.4%	-107.1%	-66.4%	-36.8%	-17.5%	0.6%	-217.7%	-156.7%	-24.3%
Taxes	---	---	---	---	---	---	---	---	---	---	---
Tax rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Net income	**($17.9)**	**($17.7)**	**($17.1)**	**($15.5)**	**($11.8)**	**($8.1)**	**($4.7)**	**$0.2**	**($39.2)**	**($68.2)**	**($24.3)**
EPS (b)	**($0.42)**	**($0.40)**	**($0.38)**	**($0.33)**	**($0.242)**	**($0.159)**	**($0.089)**	**$0.004**	**($1.20)**	**($1.52)**	**($0.47)**
(b) excludes the acquired in-process R&D											

Source: Company data, GS Research estimates.

SmartForce (SMTF)

SmartForce, based in Dublin, Ireland and run from Redwood City, California, is the leading corporate e-Learning solutions provider to Global 2000 customers. The company offers best-of-class content, services, and technology. SmartForce has the largest development and distribution team in the industry yet demonstrates impressive flexibility.

Company data	
Recommended List	
Mid-Cap Growth	
Price: $48.75	
S&P 500: 1464	
United States	

Stock data	
52-week range	$60.06-$16.38
Yield	—

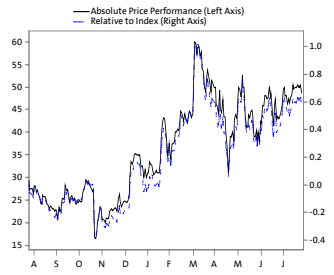
Capitalization	
Market cap	$2,486mn
Latest net debt/(cash)	—
Free float	—
Derivatives	—
Shares outstanding	51.0mn

Price performance	1M	3M	12M
Absolute	13%	28%	67%
Rel to S&P 500	11%	25%	59%

Priced at market close of July 24, 2000.

Forecasts/valuation	2000E	2001E
EPS	-$0.43	$0.28
P/S	15.4X	9.8X

Price performance chart



We consider SmartForce's best-of-breed assets attractively priced. Strong results should support solid price performance. SmartForce is our top pick for investors looking for exposure to the e-Learning space, and we have added the stock to our US Recommended List.

- SmartForce is the largest operator in the burgeoning market for corporate e-Learning. Corporate training is a $63-billion B2B opportunity, and corporate e-Learning has a sustainable competitive advantage over traditional corporate training.
- SmartForce serves more customers than any other e-Learning provider because it has the most comprehensive offering. The company invests more in R&D than any competitor, and we expect its compelling product line to only strengthen.
- As with many Internet firms, it is hard to argue that SmartForce's stock is inexpensive. The market, however, likely holds lower expectations for SmartForce than for its competitors. Also, SmartForce's current valuation is in line with historical valuations, despite improved fundamentals.
- The ongoing transition from a software business to an application service provider (ASP) model is opening new avenues of profit for the company. The addressable market, measured both by customers and product types, is expanding. These new opportunities should translate into accelerating growth in coming years.

Valuation

Our preferred expanded NPV analysis suggests that the market is not giving SmartForce due credit and expects stronger results from SmartForce's competitors than it does from the company. As the success of the company's transition to e-Learning and the strategic benefits that accompany it become more evident, we believe the market will share our high expectations for SmartForce.

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SmartForce stock trades at 15.4X and 9.8X our 2000 and 2001 revenue estimates, respectively. We view these multiples through two lenses. First, SmartForce's price-to-sales (P/S) multiples are well within its historical range. We think the stock should trade at a higher multiple than it has historically because (1) its revenue recognition is more conservative, (2) sales growth is likely to be higher than in the past, and (3) its competitive position has improved. Without assuming an expansion in the P/S multiple, SmartForce stock should be able to exceed the market's return.

Second, SmartForce attracts lower multiples than its closest public comparables, DigitalThink and Saba. Although these companies are growing faster than SmartForce, their price-to-sales-to-sales growth (P/S/G) multiples are in line with those of SmartForce. SmartForce stock should trade at a higher P/S/G multiple than its competitors because (1) its growth is likely to accelerate while that of its competitors will likely decelerate, (2) it has been profitable in the past and should be again in a few quarters, and (3) its strategic position affords the company opportunities not available to its competitors.

Key risks

Key risks facing SmartForce include (1) execution risk in the transformation to an Internet-based operator, (2) valuation of stock options grants to employees, (3) corporate structure and income tax advantages, (4) the evolving nature of corporate e-Learning, and (5) shareholder lawsuits. We feel the most potent risk is the transition to an Internet-based solutions provider. This risk should be largely eliminated by 2001, when most of the company’s customers will probably have adopted ASP delivery.

Financials

The shift in revenue recognition policies at SmartForce, away from up-front license recognition toward deferred subscription recognition, obscures the company’s accelerating growth. The best measure we can find to elucidate the company’s organic growth is total customer revenue (TCR, which is the sum of backlog and trailing 12-month revenues. TCR is relatively indifferent to revenue recognition issues and is a comprehensive measure of the business generated from SmartForce's customers in the past 12 months and committed by them for future periods. In accordance with observations from company management, TCR reflects that current growth is tracking in the 30%-32% range, exceeding the company’s old rate of approximately 25%.

SmartForce reported second-quarter results ahead of our expectations. Revenues of $36.4 million and a loss before goodwill amortization of 15¢ per share exceeded our estimates of $34 million and a loss of 17¢. Growth at the company continues to appear strong, with revenues and backlog growing 27.5% and 15.3% sequentially; we estimate TCR grew 5.7% sequentially and 36% year over year. Gross margin of 83.7% was in line with our expected margin of 84%, and we continue to expect EPS breakeven in the first quarter of 2001. Customer bookings were once again very healthy, with a dollar renewal rate of 150% and an average contract size of $125,000. Backlog at quarter’s end was $256 million, indicating that SmartForce should achieve its year-end backlog target of $350 million. We forecast a cash loss (goodwill amortization is added back) of 43¢ per share in 2000 and a profit of 28¢ in 2001. We expect revenues to reach $161.4 million in 2000 and $254.0 million in 2001.

Exhibit 54: SmartForce earnings model
$ thousands, except per-share data

	1999	Q1A 03/31/2000	Q2A 06/30/2000	Q3E 09/30/2000	Q4E 12/31/2000	2000E	Q1E 03/31/2001	Q2E 06/30/2001	Q3E 09/30/2001	Q4E 12/31/2001	2001E
Total revenue	**$197,754**	**$28,534**	**$36,393**	**$43,000**	**$53,500**	**$161,427**	**$54,000**	**$60,000**	**$65,000**	**$75,000**	**$254,000**
Sequential change		-53%	28%	18%	24%		1%	11%	8%	15%	
Year-over-year change	22%	-29%	-23%	-14%	-11%	-18%	89%	65%	51%	40%	57%
Cost of sales	29,675	4,667	$5,921	6,880	8,560	26,028	8,640	9,600	10,400	12,000	40,640
Gross profit	$168,079	$23,867	$30,472	$36,120	$44,940	$135,399	$45,360	$50,400	$54,600	$63,000	$213,360
Gross margin	85.0%	83.6%	83.7%	84.0%	84.0%	83.9%	84.0%	84.0%	84.0%	84.0%	84.0%
Research & development	31,713	8,500	10,347	10,500	12,000	41,347	12,000	12,500	13,000	13,500	51,000
Percent of Revenues	16%	30%	28%	24%	22%	26%	22%	21%	20%	18%	20%
Sales & marketing	89,308	23,193	24,813	27,500	30,000	105,506	29,000	31,000	33,000	35,000	128,000
Percent of Revenues	45%	81%	68%	64%	56%	65%	54%	52%	51%	47%	50%
Smartforce launch	4,533										
Percent of Revenues	2%										
General & adminstrative	17,042	4,464	4,841	4,900	5,000	19,205	5,250	5,500	5,750	6,000	22,500
Percent of Revenues	9%	16%	13%	11%	9%	12%	10%	9%	9%	8%	9%
Amortization	3,441	1,717	2,240	2,200	2,200	8,357	2,200	2,200	2,200	2,200	8,800
Percent of Revenues	2%	6%	6%	5%	4%	5%	4%	4%	3%	3%	3%
Acquired R&D											
Percent of Revenues											
Cost of acquistions	5,900										
Percent of Revenues	3%										
Operatingl Costs	151,937	37,874	42,241	45,100	49,200	174,415	48,450	51,200	53,950	56,700	210,300
Percent of Revenues	77%	133%	116%	105%	92%	108%	90%	85%	83%	76%	83%
Operating income	$16,142	($14,007)	($11,769)	($8,980)	($4,260)	($39,016)	($3,090)	($800)	$650	$6,300	$3,060
Margin	8.2%	-49.1%	-32.3%	-20.9%	-8.0%	-24.2%	-5.7%	-1.3%	1.0%	8.4%	1.2%
Sequential change									-181.3%	869.2%	
Year-over-year change	11.6%										
Other income, net	3,192	1,154	1,037	1,200	1,250	4,641	1,275	1,300	1,350	1,400	5,325
Interest, net											
Pre-tax profit	$19,334	($12,853)	($10,732)	($7,780)	($3,010)	($34,375)	($1,815)	$500	$2,000	$7,700	$8,385
Margin	9.8%	-45.0%	-29.5%	-18.1%	-5.6%	-21.3%	-3.4%	0.8%	3.1%	10.3%	3.3%
Taxes	**3,708**	(1,671)	(849)	(778)	(301)	**(3,599)**	(182)	65	260	1,001	**1,145**
Rate	19%	13%	10%	10%	10%	10%	10%	13%	13%	13%	14%
Net profit	**$15,626**	**($11,182)**	**($9,883)**	**($7,002)**	**($2,709)**	**($30,776)**	**($1,634)**	**$435**	**$1,740**	**$6,699**	**$7,241**
Margin	8%	-39%	-27%	-16%	-5%	-19%	-3%	1%	3%	9%	3%
Sequential change							-40%	-127%	300%	285%	
Year-over-year change	-6%				-132%						
EPS	**$0.31**	**($0.22)**	**($0.19)**	**($0.13)**	**($0.05)**	**($0.60)**	**($0.03)**	**$0.01**	**$0.03**	**$0.11**	**$0.12**
EPS w/goodwill amtsn. add-back		**($0.19)**	**($0.15)**	**($0.09)**	**($0.01)**	**($0.43)**	**$0.01**	**$0.05**	**$0.07**	**$0.14**	**$0.28**
Average shares in issue (m)	51.0	50.4	51.0	52.0	53.0	51.6	54.0	57.0	59.0	62.0	58

Source: Company data, GS Research estimates.

Sylvan Learning Systems (SLVN)

Sylvan Learning Systems is a clicks-and-mortar e-Learning company comprised of Sylvan Learning Group, Sylvan International Universities, and Sylvan Ventures. Sylvan Learning Group runs Sylvan Learning Centers, Sylvan Education Solutions, and English Language Instruction. Sylvan International Universities aims to build a collection of international universities. Sylvan Ventures is a $400-million incubator fund.

Company data	
Market Performer	
Small-Cap Growth	
Price: $11.81	
S&P 500: 1464	
United States	

Stock data	
52-week range	$26.13-$11.00
Yield	—

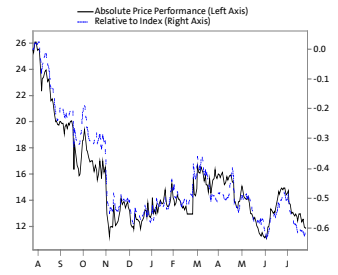
Capitalization	
Market cap	$609mn
Latest net debt/(cash)	—
Free float	—
Derivatives	—
Shares outstanding	51.6mn

Price performance	1M	3M	12M
Absolute	-21%	-12%	-54%
Rel to S&P 500	-23%	-14%	-62%

Priced at market close of July 24, 2000.

Forecasts/valuation	2000E	2001E
EPS	$0.40	$0.48
P/E	29.5X	24.6X

Price performance chart



Emerging e-Learning company worth watching. Sylvan has taken ambitious steps to create a leading clicks-and-mortar company. We have initiated coverage of Sylvan with a Market Performer rating. Sylvan's inexpensive valuation is tempered by limited visibility of its operations and future strategy.

- Sylvan trades at 29.5X and 24.6X our 2000 and 2001 EPS forecasts, respectively. Our preferred expanded NPV valuation approach reveals, however, that market expectations for Sylvan are low. Implicit in Sylvan's current market capitalization is almost no expectation of economic value creation by Sylvan's incubator and International Universities divisions.

- Due to the sale of Prometric and other changes in the company's core business (Sylvan Learning Group), the recurring profitability and growth rates of Sylvan's core business are difficult to discern from reported historical results. The nascent stage of the incubator and International Universities divisions hampers efforts to evaluate their prospects.

- Sylvan stock has outperformed the market for extended periods in the past, and current market pessimism creates the opportunity to purchase the stock at a low valuation. Still, we expect the risk-reward ratio at Sylvan to improve, and we suggest that investors defer commitments until further evidence regarding Sylvan's core operations and future strategies unfolds.

Valuation

Four variables determine Sylvan's value: (1) core operations (Sylvan Learning Group), (2) management's options and incentives, (3) future operations at the incubator, and (4) future operations at the International Universities division. Our expanded NPV approach first requires us to value Sylvan's current core operations. We place a value on these core operations of $300 million; deducting $101 million for management's options from this value yields an equity value for the core operations of $199 million. If the market also values Sylvan's core operations at $199 million, then it expects

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Sylvan's cash investment in the incubator of $220 million to have an NPV of $153 million and likely values its 71% stake in the incubator's $65 million of e-Learning assets at $46.2 million. It also expects the International Universities division's cash investment of $100 million to be currently worth $102.7 million.

Market expectations for Sylvan's incubator and International Universities division fall far below those of other e-Learning companies. The transition in Sylvan's core operations, coupled with the nascent stage of its incubator and International Universities division, probably account for much of the market's lack of enthusiasm. Sylvan has proven itself capable of outperforming the market in the past, so investors should monitor events at the company carefully. We believe that those looking to invest in Sylvan may face a better risk-reward profile in the upcoming quarters than they do today. Accordingly, we would defer new investments in the company despite low market expectations and the low valuation. We are cautiously optimistic.

Key risks

- **Uncertain results from Sylvan's core.** Sylvan recently sold the largest division in its core operations, Prometric. Additionally, it is changing the business model at some of its remaining core operations. These events have contributed to management's EPS growth guidance of 10%-plus, down from 30%-40%. We expect EPS growth to exceed 10%, but fully recognize that results from Sylvan's core business remains uncertain.

- **Potential for incentive misalignment.** Management members own a large portion of Sylvan stock, and its total compensation is also tightly linked to results at the incubator and the International Universities division. This could lead to a misalignment with investor interests in terms of asset transfers between divisions, cost allocations, and incubator investments. The presence of independent directors on the board of Sylvan and the incubator does mitigate this risk.

- **Development stage of the incubator.** The incubator had publicly announced only two investments and is still looking to hire several professionals. It has yet to comment on all details of its strategy and operating structure. As the incubator controls more of Sylvan's value than any other division, its nascent state meaningfully increases the risk of an investment in Sylvan.

Financials

We estimate that Sylvan's 2000 revenues will be $350 million, growing 11% to $390 million in 2001. We forecast EPS of 40¢ in 2000, growing 21% to 48¢ in 2001. EPS improvement should be driven by top-line growth, the cessation of non-recurring charges, and Sylvan's share buyback program. We expect Sylvan's core operations to generate long-term EPS growth in the low teens. We exclude the costs generated at Sylvan Ventures' incubator from our net income calculations.

Exhibit 55: Sylvan Learning Systems earnings model

$ thousands, except per-share data

	1999 Full Year	1st Qtr 2000A	2nd Qtr 2000E	3rd Qtr 2000E	4th Qtr 2000E	2000E Full Year	2001E Full Year
Revenues							
Franchise Services	$34,160	$7,653					
Company-owned Learning Centers	42,153	11,114					
Schulerhilfe	14,351	3,892					
Learning Center Division total	$90,664	$22,659	$24,980	$24,624	$22,500	$94,763	$104,596
Sequential Change		12%	10%	-1%	-9%		
YOY Change	40%	14%	6%	-9%	11%	5%	10%
Public/Non-public schools	65,741	20,637					71,000
Canter	35,522	5,308					42,626
Education Solutions	101,263	25,945	28,000	16,184	30,000	100,129	113,019
Sequential Change		-17%	8%	-42%	85%		
YOY Change	17%	-5%	15%	-12%	-4%	-1%	13%
WSI	55,448		13,000	14,500	15,000		62,000
Aspect	61,446		10,000	21,000	10,000		55,000
English Language total	116,894	22,178	23,000	35,500	25,000	105,678	117,000
Sequential Change		-31%	4%	54%	-30%		
YOY Change	21%	-1%	-16%	1%	-22%	-10%	11%
Universidad Europea de Madrid	32,275	14,501	16,000	1,000	17,500		
International University total	32,275	14,501	16,000	1,000	17,500	49,001	55,000
Sequential Change			10%	-94%	1650%		
YOY Change			9%	-31%	9%	52%	12%
Total Revenues	**$341,096**	**$85,283**	**$91,980**	**$77,308**	**$95,000**	**$349,572**	**$389,615**
Sequential Change		-14%	8%	-16%	23%		
YOY Change	38%	23%	2%	-6%	-5%	2%	11%
Expenses							
Franchise Services	16,951	4,471					
Company-owned Learning Centers	36,269	9,696					
Schulerhilfe	12,079	3,490					
Learning Center Division total	65,299	17,657	18,735	18,222	17,550	72,164	80,000
Operating Margin	28%	23%	25%	26%	22%	24%	24%
Public/Non-public schools	58,550	17,989					
Canter	22,405	6,089					
Education Solutions	80,955	24,078	23,800	13,271	24,000	85,149	91,500
Operating Margin	20%	6%	15%	18%	20%	15%	19%
WSI	40,506		11,700	12,398	12,750		52,500
Aspect	65,061		12,300	19,000	12,000		57,000
English Language total	105,567	22,366	24,000	31,398	24,750	102,514	109,500
Operating Margin	10%	-1%	-4%	12%	1%	3%	6%
Universidad Europea de Madrid	29,420		13,600	4,000	11,725		
International University total	29,420	11,816	13,600	4,000	11,725	41,141	44,500
Operating Margin	9%	19%	15%	-300%	33%	16%	19%
Restructuring costs	5,127						
Non-recurring expenses	10,278						
G&A, International U. Only			900	900	900	2,700	5,000
General & Administrative	23,903	4,801	4,300	4,300	4,300	17,701	18,000
Total Expenses	$320,549	$80,718	$85,335	$72,091	$83,225	$321,369	$348,500
Operating Income	**$20,547**	**$4,565**	**$6,645**	**$5,218**	**$11,775**	**$28,203**	**$41,115**
Operating Margin	6%	5%	7%	7%	12%	8%	11%
Non-Recurring Non-Operating	(13,370)						
Interest & Other Income	1,066		5,000	2,600	1,000	8,600	4,000
Interest Expense	(4,866)		(1,750)	(1,750)	(1,750)	(5,250)	(7,000)
Equity in Affiliates	(2,355)						
Minority Interest	(319)		(524)	966	(1,456)	(1,014)	(2,346)
Exchange Gain/(Loss)	(758)						
Non-Operating items	(20,602)	(1,201)	2,726	1,816	(2,206)	1,135	(5,346)
As % of Rev.	-6%	-1%	3%	2%	-2%	0%	-1%
Pre-tax Income	(55)	3,364	9,371	7,034	9,569	29,338	35,769
Sequential Change		-113%	179%	-25%	36%		
YOY Change	-100%	29%	22%	-54%	-137%	-53441%	22%
Income Tax	$1,056	($793)	($3,617)	($2,715)	($3,694)	($10,819)	($13,807)
Tax Rate	1919%	40%	39%	39%	39%	37%	39%
Income From Continuing Operations	$1,001	$2,571	$5,754	$4,319	$5,875	$18,519	$21,962
Margin	0.3%	3.0%	6.3%	5.6%	6.2%	5.3%	5.6%
Discontinued Operations							
Income from discontinued ops.		(1,647)					
Gain on disposal of disc. ops.		288,454					
Net Income	**$1,001**	**$2,032**	**$5,754**	**$4,319**	**$5,875**	**$18,519**	**$21,962**
Sequential Change			183%	-25%	36%		
YOY Change		-70%	-9%	-66%		1751%	19%
Income From Continuing Operations Before Restructuring and Non-Recurring							
Before Taxes	28,720						
After Taxes (Assumed Rate of 38.9%)	17,548						
Earnings Per Share - Diluted (After tax)	**0.33**	**0.04**	**0.12**	**0.10**	**0.13**	**0.40**	**0.48**
Weighted Average Shares - Diluted	53,157	51,570	46,500	44,000	44,500	46,643	45,750
Sylvan Ventures Development Costs		(1,382)	(1,800)			(3,182)	

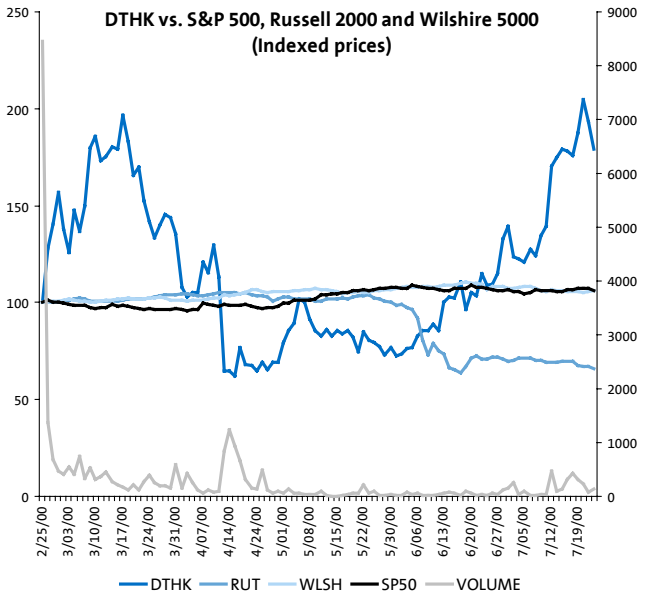
Source: Company data, GS Research estimates.

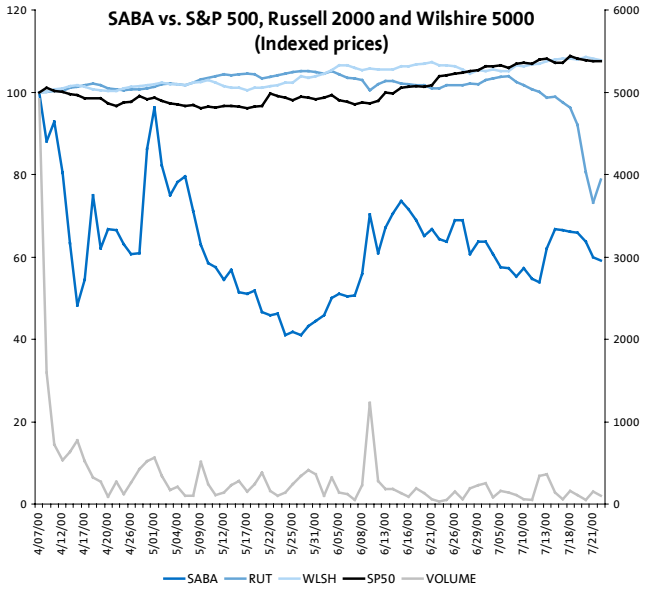
Goldman, Sachs & Co. or an affiliate has managed or comanaged a public offering of the following companies' securities in the past several years: Saba Software, Inc. Goldman, Sachs & Co. or an affiliate makes an over-the-counter market in Saba Software, Inc. common stock; SmartForce American Depositary Receipts. Goldman, Sachs & Co. or an affiliate has rendered significant corporate finance services to the following companies or one of its affiliates within the past 12 months: Sylvan Learning Systems, Inc. Goldman, Sachs & Co. or an affiliate may deal as principal in any of the securities mentioned.

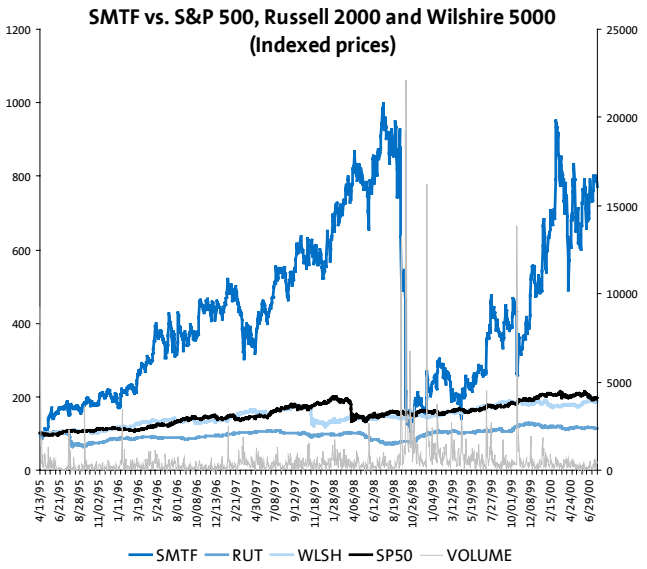
Stock Ratings:

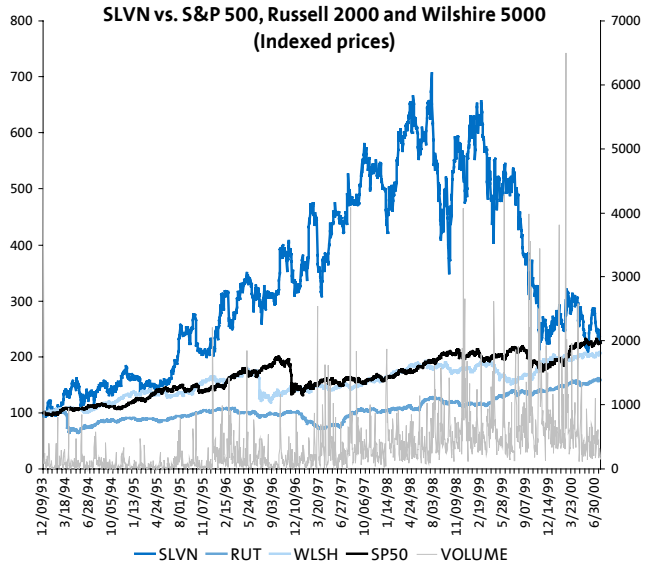
RL: Recommended List
LL: Latin America Recommended List
TB: Trading Buy
MO: Market Outperformer
MP: Market Performer
MU: Market Underperformer

e-Learning stock price performance









Source: FactSet Research System.