

## Experience with Simulator-Based Help for Operator Training at CFP Mont-Laurier (Québec)

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## Presentation Outline

- forest industry operator training challenges
- forestry machine simulation
- operator training at CFP Mont-Laurier
- Simlog's "Personal Simulators"
- the "Simulator Lab" at CFP Mont-Laurier
- simulator-based training's added value
- conclusions

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## The Changing Context of Workforce Training (1)

Working in the woods today requires higher levels of skill:

- new industry-led certification of logging practices
- increasing governmental regulation
- rising costs of purchasing, operating, and maintaining equipment

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## CFP Mont-Laurier (1)



Web site: [www.cfpml.qc.ca](http://www.cfpml.qc.ca)

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## CFP Mont-Laurier (2)

Two forest industry training programs

- Cut-To-Length  
("Abattage-façonnage de bois")
- Logging Road Building  
("Voirie forestière")

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## CTL Operator Training (1)

- typical class size: 1 group of 15 students
- 2 classes per year
- program duration:
  - 11 weeks at school (classroom, maintenance garage, Simulator Lab)
  - 8 weeks of seat-time in the woods (day and night shifts)
  - 3 weeks of work term with local mechanized logging contractors

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## CTL Operator Training (2)

Seven pieces of equipment:

- 3 harvesters
  - 2 tracked carriers with dangle-type harvester head attachments
  - 1 wheeled harvester
- 4 forwarders

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## Logging Road Building Operator Training (1)

- typical class size: 2 groups of 15 students
- 2 to 3 classes per year
- program duration
  - 5 weeks at school (classroom, maintenance garage, Simulator Lab)
  - 9 weeks of seat-time (day and night shifts)
    - 1 week of “preparation” (in a quarry)
    - 8 weeks of road construction (in the woods)

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## Logging Road Building Operator Training (2)

Fourteen pieces of equipment:

- 5 hydraulic excavators
- 2 wheel loaders
- 3 dozers
- 2 motor graders
- 2 articulated trucks

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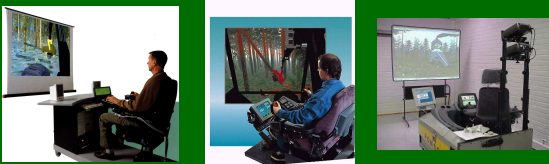
## The Changing Context of Workforce Training (2)

But attracting young people to the industry is increasingly difficult:

- they have different expectations
- they like to learn differently
- they are waiting for simulation technology ...

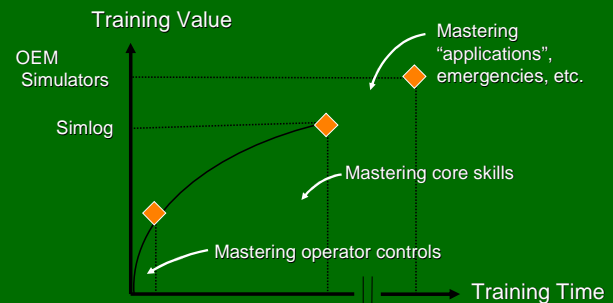
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## OEM Simulators



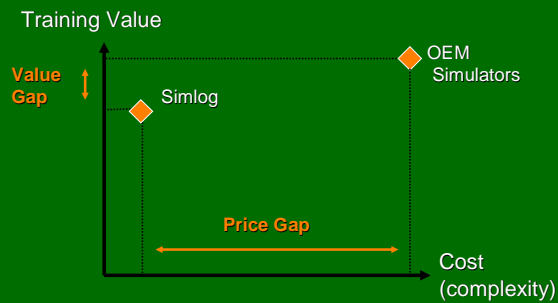
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## Targeting Cost-Effectiveness (1)



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## Targeting Cost-Effectiveness (2)



## Simlog's "Secrets"

- you use *your* Windows PC
- you use *off-the-shelf* "USB ready" controls

Simlog provides just the simulator "ingredients"

→ new "do it yourself" **Personal Simulator** training help!

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## Unique Cost-Effectiveness

For the same \$, deploy a "room full" of Personal Simulators for the price of just *one* OEM simulator!

- More students can train at the same time.
- Each student can receive more simulator-based help in the same amount of scheduled training time, i.e. over the same time period.

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## Putting Cost-Effectiveness to Work !



Simulator Lab at  
CFP Mont-Laurier  
(world's largest!)

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## Simulator Lab Details (1)

- established in April 2006
- 16 PC-based training stations
  - Harvester Personal Simulator
  - Forwarder Personal Simulator
  - Hydraulic Excavator Personal Simulator

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## Simulator Lab Details (2)



"Universal" Simulator Controls:

- industrial 2 axis joysticks with 8 push-buttons
- USB connectivity

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## Student Stations



- simulation software
- simulator controls
- mounting brackets
- desktop PC
- LCD display

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## Trainer's Station



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## Simulator Lab Help with Operator Training

Typical *per student* simulator-based training:

- CTL Operator Training: 60 hours
- Logging Road Building: 40 hours
- students typically train in 3 hour intervals ("sessions")

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## Training Benchmarks

Simulateur d'abatteuse	
Objectifs par module (progressif)	
Objectif 1	...
Objectif 2	...
Objectif 3	...
Objectif 4	...
Objectif 5	...
Objectif 6	...
Objectif 7	...
Objectif 8	...
Objectif 9	...
Objectif 10	...
Objectif 11	...
Objectif 12	...
Objectif 13	...
Objectif 14	...
Objectif 15	...
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Objectif 45	...
Objectif 46	...
Objectif 47	...
Objectif 48	...
Objectif 49	...
Objectif 50	...

Simulateur de transporteur	
Objectifs par module (progressif)	
Objectif 1	...
Objectif 2	...
Objectif 3	...
Objectif 4	...
Objectif 5	...
Objectif 6	...
Objectif 7	...
Objectif 8	...
Objectif 9	...
Objectif 10	...
Objectif 11	...
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Objectif 48	...
Objectif 49	...
Objectif 50	...

Simulateur de pelle	
Objectifs par module (progressif)	
Objectif 1	...
Objectif 2	...
Objectif 3	...
Objectif 4	...
Objectif 5	...
Objectif 6	...
Objectif 7	...
Objectif 8	...
Objectif 9	...
Objectif 10	...
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Objectif 49	...
Objectif 50	...

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## Tracking Progress (sample)

### Simulateur de pelle hydraulique

Nom :  
Prénom :

		Bloc de					
		10	10	15	25	30	Terminé
		Cumulatif					
		10	20	35	60	90	
Module : Chargement de camion	Temps d'exécution moyen	<= 9 s					
	Volume transféré à la cible	>= 97%					
	Distance moyenne de chute	<= 2,0 m					
	Nombre de collisions	<= 0,1					
	Nombre de limite de course	<= 0,1					

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## 149 students to date!

	CTL Operator Training (# students)	Logging Road Building (# students)
2005-2006	1st class: 17 2nd class: 9	1st class: 28 2nd class: 30
2006-2007	1st class: 5	1st class: 30 2nd class: 30

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## Some Observations by the Supervisors in the Woods

- training program quality is better
  - work is of higher quality
  - output is substantially the same (despite reduced seat-time)
- training costs are reduced
  - fewer hours → lower maintenance costs
  - fewer accidents → lower repair costs

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## Some Comments from the Supervisors in the Woods

- “Students work more safely in the woods.”
- “The simulators help “poorer” students “catch up” to better ones *before* seat-time begins.”
- “I can take my students *farther* because I can teach them more advanced techniques.”
- “*Despite the reduced seat-time*, students work more carefully and produce much better quality.”
- “I would never train without them [the simulators].”

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## Return on Investment

An approximate financial portrait:

- *one time* Simulator Lab investment: ~ USD\$110K
- *per class* savings (both programs) associated with less training time in the woods: ~ USD\$65K
- *annual* savings @ 2 classes per year: ~ USD\$110K

→ “break even” point after just one year !  
[not counting lower maintenance/repair costs]

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## On the Horizon (2008, etc.)

New simulator-based help (from Simlog) for training operators of other logging road building equipment:

- wheel loader
- dozer
- motor grader

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## Conclusions

- forestry industry training programs must work harder to attract young people and train them better
- simulators can help
- Simlog's can offer unique cost-effectiveness
- CFP Mont-Laurier's experience with their Simulator Lab *confirms* that a “room-full” of Personal Simulators is the right choice to make!

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