PROVING THE ROI FOR ON-THE-JOB TRAINING FOR STREAMING MEDIA EMPLOYEES

A White Paper by Jan Ozer

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OVERVIEW

The streaming industry is a complex ecosystem with dozens of diverse products and services, endless confusing acronyms, and a range of unique and highly complex technologies. Yet many companies don't have a formal program for getting new technical employees in streaming media-related functions trained on the multiple facets

This white paper reviews the benefits and financial ROI of employee training and the multiple benefits that deliver that ROI, including accelerated time to proficiency, enhanced customer satisfaction, and enhanced employee retention. It also details how the Streaming Learning Center course Streaming Media 101 has helped dozens of streaming companies, including Dolby, BItmovin, and many others, accelerate the development of their technical staff.

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THE ROI OF EMPLOYEE TRAINING

After introducing the Streaming Media 101 course, this paper will discuss three key components of the return on investment produced by employee training, which are:

▶ Accelerated time to proficiency

▶ Enhanced customer satisfaction

▶ Improved employee retention

Then it will summarize these findings and discuss the returns on investments reported by multiple technology and other companies in published studies. Along the way, largely using reviews and testimonials provided by our learners and their companies, we'll identify how Streaming Media 101 can help streaming media companies realize similar ROIs.

ROI COMPONENT 1: ACCELERATED TIME TO PROFICIENCY

By necessity, many technical hires into streaming-media related positions have little experience with encoding or media delivery beyond watching Netflix on their SmartTVs and YouTube on their smartphones. Yet job proficiency requires at least a basic knowledge of streaming technologies and fundamentals. As shown in Figure 1, **structured training** can **reduce time-to-proficiency** by 30-50%. With technical employees paid from US $35,000 - $100,000+, accelerating time to efficiency by even a few weeks will deliver substantial return on investment.
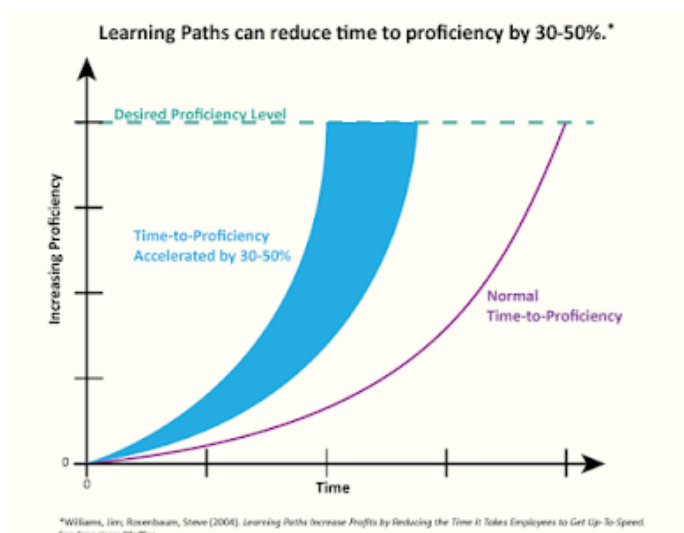

Figure 1. Structured learning can reduce time to proficiency by 30-50%.

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Both individual learners and companies that have adopted Streaming Media 101 report that it does reduce time to proficiency. One reviewer (Thomas McClave) commented:

> As an individual working in the live-streaming video space, *I wish I had taken this course sooner.* Many of the things that I have picked up during my ~1 year in video were solidified over the span of this course, and *my only regret is that I had not taken it as soon as I started at my new company. Most excitingly, I've been able to apply some things I picked up from the course mere hours after completing it* - a clear indicator of value in my eyes.

Another reviewer (Jason Evans) stated that *"This course was extremely informative, there is nothing else like it out there and I would highly recommend it to anyone looking to learn a solid foundation in the streaming media field."*

Dolby Laboratories has made the course available to all new employees in several technical departments. One Dolby manager, David Trescot, explained that, *"Our team has enjoyed the class, and it has accelerated their learning in streaming media and enhanced overall productivity."*

Onboarding Engineers

Streaming Media 101 has proven particularly valuable to engineers involved in streaming media development and deployment. One engineer (Chris Joyce) shared, *"As an engineer, I wasn't sure what to expect and didn't want to pay for some fluffy sales type material. Jan's course didn't disappoint as he delves right in with hands-on tutorials and covers a broad spectrum of streaming workflows and platforms. I highly recommend his course from the executive to the engineer and everyone in between."*

Another engineer, (Alla Petrova), shared that *"I found the course valuable as it provides for a better understanding of the industry. As an engineer working with media technology, I got some missing pieces for a deeper understanding of the media problem space."*

Finally, Bitmovin added all Streaming Media 101 lessons to their own learning management system. As explained by HR Director Michael Peter, *"We needed a comprehensive video technology training course to quickly and effectively ramp up our newest back-end engineering hires to match our innovative and quickly-changing products. The integration of Jan Ozer's Streaming Media 101 course into our Bitmovin Campus learning system instantly improves our ability to train new hires,"*

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Research-Based Advice for New Compressionists

Streaming Media 101 has also proven useful for publishers of VOD and live content, particularly for AVOD and SVOD distributors. The course dives deeply into encoding decisions like x264 and x265 preset selection, I- and B-frame intervals, the optimum settings for reference frames, and the like. All recommendations are based on extensive research and analysis.

For example, choosing the optimal preset for x264 encoding is a major decision involving both throughput (and encoding cost) and quality. The chart below tracks average VMAF quality (blue), low-frame VMAF quality (a measure of transient quality issues) and encoding time (yellow) to identify the optimal preset in a VOD encoding setting. To produce the table, we encoded eight two-minute test files to the ten different presets and collected 240 VMAF measurements.

As the table shows, the Faster preset is the fastest that should be considered, and would increase throughput (and encoding cost) by 43% as compared to the Medium preset. On the other hand, it makes little sense to use presets higher than Medium; the quality delta is insignificant and using the Veryslow preset would more than double encoding time.

Average Quality, Low-Frame Quality and Encoding Time Per x264 Presets
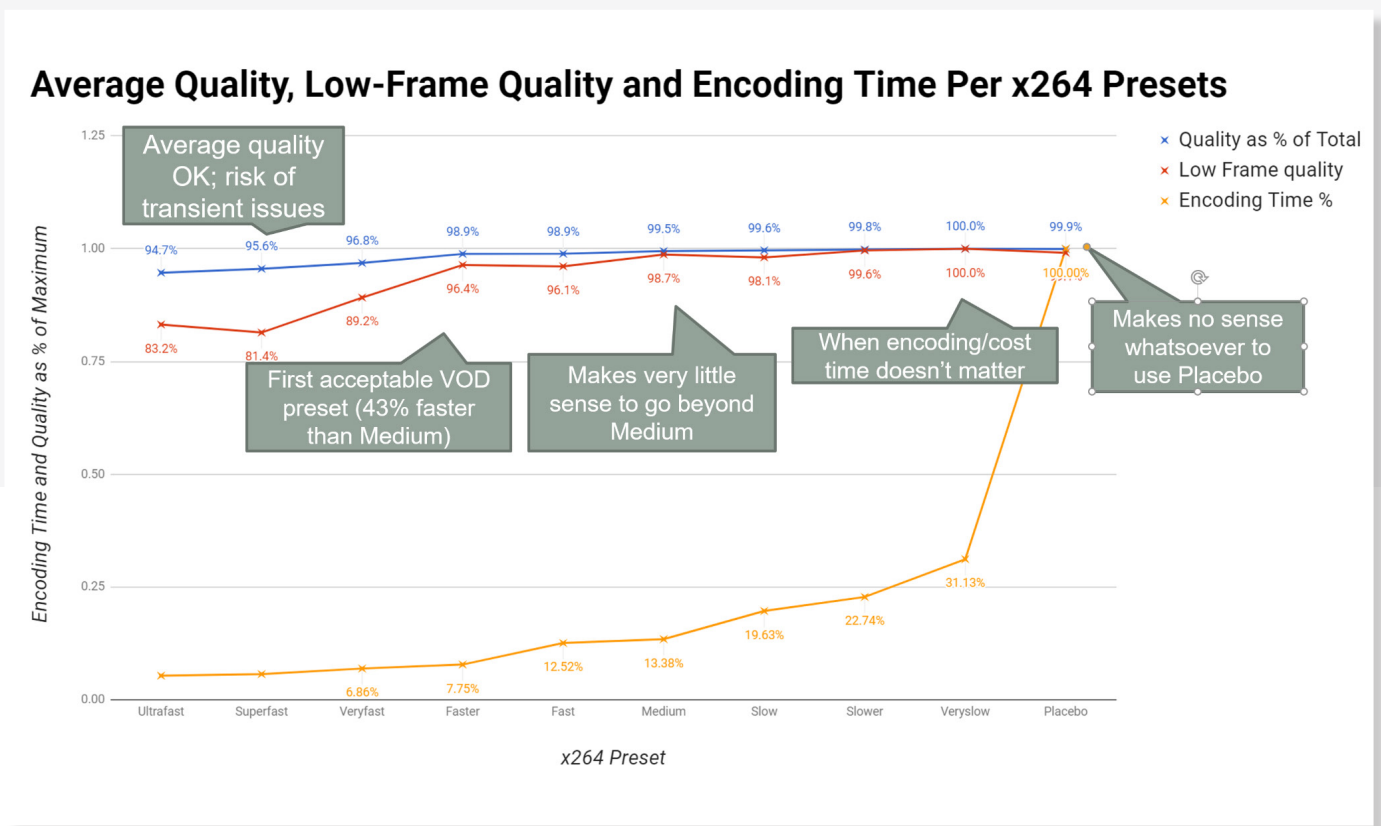
Non-encoding related lessons are often based on articles that have appeared in Streaming Media magazine (so have been vetted by the readers) and have been presented in multiple pre-conference sessions at Streaming Media events and other training events. These lessons benefit from the input from previous attendees and multiple iterations for correctness and clarity. Overall, the course provides the technical background and research-based recommendations to quickly allow learners to optimize their encoding ladders and file configurations and knowledgeably contribute to other encoding and delivery-related decisions.

Streaming Media 101 costs $299 with volume discounts available. With technical employees paid from US $35,000 - $100,000+, accelerating time to efficiency by even a few days should more than justify the investment.

STREAMING COMPANY TESTIMONIALS

David Trescot · 1st
Sr. Director at Dolby Laboratories

Dolby – Streaming Media 101 "Accelerated learning ...and enhanced overall productivity."

"Jan's course is a "must watch" for new employees in our streaming media group. The course is highly valuable and continually updated. Students learn about encoding, packaging, delivery, and the streaming media ecosystem. Our team has enjoyed the class, and it has accelerated their learning in streaming media and **enhanced overall productivity.** Definitely a good investment!"

More **here:**

Michael Peter · 1st
HR Director @ Bitmovin

Bitmovin – "Instantly improves our ability to train new hires"

"We needed a comprehensive video technology training course to quickly and effectively ramp up our newest back-end engineering hires to match our innovative and quickly-changing products. The integration of Jan Ozer's Streaming Media 101 course into our Bitmovin Campus learning system *instantly improves our ability to train new hires*," said Michael Peter, Director of HR, Bitmovin.

More **here:**

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ROI COMPONENT 2: ENHANCED CUSTOMER SATISFACTION

To provide outstanding customer service your customer-facing employees must understand what the customer is hoping to accomplish and their pain points. While it's inevitable that support staff and sales engineers will someday talk to clients more knowledgeable than themselves about some aspects of the streaming industry, these employees are **"expected to have, at the very least, some basic level of competency when it comes to your customers and industries."** Beyond that, it's **"important to understand the inner workings of your customers' businesses in order to best serve them."**

It's clear that deep industry and technology knowledge translates to customer satisfaction, as *"78% of customers say competent customer service reps are most responsible for happy customer experience."* Long story short, your customer facing employees must quickly become streaming experts to help streaming experts.

Streaming Media 101 has two components to boost new employee expertise, curriculum (lessons and quizzes) and exercises. Regarding the curriculum, one reviewer (Alan Raymond) commented, *"This course does a great job of not only teaching technical fundamentals but also explaining the state of the state of the broadcast streaming world including various players like manufacturers, service providers, standards bodies, codecs and the like. Well worth the investment in both $ and time."* Another (David Leslie) stated that *"I found this course to be very helpful. I really wanted to learn more about HLS, DASH and CMAF and it was covered very well in this course."*

Exercises are lessons taught with open source or freely downloadable tools so that learners can follow along. They teach critical skills and operations that you would expect someone proficient in streaming media to know how to perform. These exercises include:

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- How to analyze files in MediaInfo and Bitrate Viewer.
- How to measure VMAF and PSNR with the Moscow State University Video Quality Measurement Tool (VQMT) (and what the scores mean).
- How to encode with Handbrake and FFmpeg.
- How to encode using CBR and VBR (and what the differences are)
- How to produce H.264, VP9, and HEVC (in Handbrake) and how the codecs compare qualitatively (using VQMT).
- Encoding parameters to use for a mezzanine file for upload to a user-generated content (UGC) site or online video platform (OVP)
- How to upload a file to a user-generated content (UGC) site or online video platform (OVP).
- How to choose encoding parameters for live streaming, and how to connect to your live streaming service provider.
- How to measure outbound streaming bandwidth with www.speedtest.net.
- How to embed videos from a VOD or live streaming service into your web pages.

So, beyond industry and technology knowledge, learners acquire the skills essential to day to day streaming media operations, for their own use or the benefit of your customers. One reviewer (Michael Pinto) put it this way: *"I work in streaming media and have been looking for an intro course like this for some time. I highly recommend this course due to its clear explanation of industry concepts, measurements and trends. The exercises are helpful in cementing the information from the lessons. This class was money well spent!"*

Consistent Advice and Recommendations

The other benefit of a training course for customer-facing employees is the consistency of knowledge and recommendations. When a customer asks questions like what's the best I-frame interval, when VVC will become relevant, the optimum data rate maximum for VBR encoding, or the optimum data rate for 1080p mezzanine files to upload to OVP sites, it's best if they get the correct answer, and the same answer from all employees.

Clearly, proficient customer-facing staff helps produce happier and more profitable customers. The *Streaming Media 101* course is an efficient and effective way to train new staff.

ROI COMPONENT 3: ENHANCED EMPLOYEE RETENTION

With global unemployment rates dropping, employee retention becomes critical to all managers, and there's a clear link between training and retention, particularly with Millenials. Overall, in one survey, *"68% of employees surveyed say training and development is the company's most important policy to retain workflows."*

Training and Development

68%

68% of employees say training and development is the most important company policy to retain their workforce.

One demographic critical to many technical jobs are Millennials, or those born between 1980–1996. In **Gallup's 2016 report How Millennials Want to Work and Live,** surveys found that 59% of Millennials report that opportunities to learn and grow are extremely important to them when applying for a job."

59%
OF MILLENNIALS

report that opportunities to learn and grow are extremely important to them when applying for a job.

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From this, Gallup concluded that, *"As part of their attraction strategy, companies should accentuate their learning and development programs, pointing to tuition reimbursement policies, on-the-job training, means of certification for going from good to great in the same role"* Obviously, what's good for recruitment is good for retention.

Putting numbers to this concept is challenging, and clearly the lack of a training program is only one of several factors contributing to an employee decision to look elsewhere. Still, **this Forbes article** points to "off-the-shelf estimates" which "set the cost of an entry-level position turning over at 50 percent of salary; mid-level at 125 percent of salary; and senior executive over 200 percent of salary."

Even if you consider these estimates overly high it's clear that replacing an employee is expensive. And training has clearly been linked to employee satisfaction and retention. One study found that 91% of surveyed employees reported that training produced a very high, high, or moderate positive impact on job satisfaction.
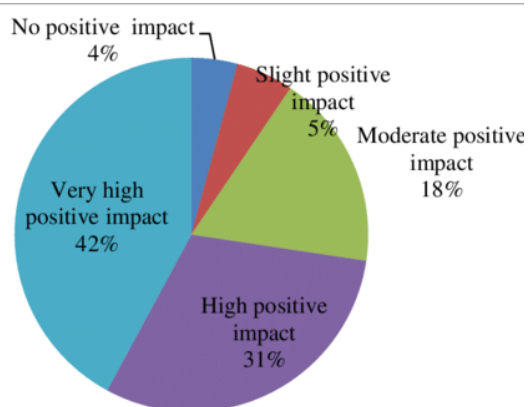
The Impact of Training on Job Satisfaction

On retention, **Accenture's study, "Running Training Like a Business**," reported that as a result of training, employees stayed with the company 14% longer, and were more than two times more likely to expect to be with the company in two years. As we saw above, training was also one of the three top three criteria considered by job candidates choosing where to work.

Regarding Streaming Media 101, it's significant that several students have posted the course on their LinkedIn profiles, with some even posting their certificate of completion. One recent student from Tata Elxsi

completed the course, posted his certificate on **LinkedIn** and commented, Great insights into the practice of choosing the best codec & bitrate ladder Jan Ozer Thank you for the certification :) Excited for Streaming media 101! So, it's clear that they value the credential.

Of course, to achieve the certificate, the student must watch all the videos, perform all the exercises, ***and*** achieve a 100% score on all quizzes. This provides assurance to the employer that the learner was present and paying attention.

ROI: THE BOTTOM LINE: TRAINING ROI

So, what's the bottom line on training ROI? The numbers are all over the map.

Not surprisingly, in the aforementioned report, Accenture found that their internal training efforts yielded a massive internal ROI of 353%. A report from the **Lumina Foundation** found that Cigna realized a 129% ROI from its educational reimbursement program between 2012 and 2014. Other Lumina Foundation reports found that Discover's tuition reimbursement program produced an **overall 144% return** on investment, and that a large communications technology company realized a more down-to-earth 39.2% ROI on their tuition assistance program.

While impressive, to a degree, all ROI numbers are necessarily "soft" and particular to each company. Hopefully, previous sections of this paper have convinced you of the tangible and intangible benefits of training and how Streaming Media 101 can help accelerate time to proficiency, improve customer service, and perhaps even contribute to retaining your key streaming media related employees.

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INTRODUCING STREAMING MEDIA 101

Let's start with a brief introduction to Streaming Media 101 which was released in April 2020 and costs $299.

This 9-hour video course teaches the technical fundamentals and skills necessary to produce and distribute streaming media. It enables organizations to efficiently provide employees with the knowledge required to succeed in streaming media-related jobs. Employers can ensure completion via the completion certificate. The course includes:

► 56 Video Lessons (averaging about 7 minutes). Students must complete all lessons to receive the completion certificate.

► 43 quizzes accompany key lessons and range from 3-8 multiple-choice questions. Students must score a 100% on all quizzes to receive the completion certificate.

► 14 exercises that use free or open-source tools to reinforce technical fundamentals and teach new skills. Students will encode multiple files with HandBrake and FFmpeg, analyze them with MediaInfo and Bitrate Viewer, and measure quality with VMAF. Students must complete all exercises to receive the completion certificate.

► 1 Certificate of Completion

The course is divided into these nine sections. .

► **Section 1. Technology Fundamentals** (compression, codecs, distribution alternatives).

► **Section 2. Tools and Metrics** (MediaInfo, Bitrate Viewer, Moscow State Video Quality Measurement Tool, Rate-Distortion Curves/BD-Rate Functions, Introduction to FFmpeg).

► **Section 3. Generic Encoding Parameters** (data rate, resolution, frame rate, bitrate control techniques, CRF Encoding, VBV buffer, I, B, and P-frames, reference frames).

► **Section 4. Working with H.264** (about H.264, H.264 profiles, levels, and entropy coding, x264 presets, AAC audio compression).

► **Section 5. Working with Other Codecs** (VP9, HEVC, AV1, VVC, EVC, and LCEVC).

► **Section 6. Adaptive Bitrate Technologies** (HTML5 playback architecture, MSE, EME, DASH, HLS, choosing an ABR technology, dynamic and static packaging, CMAF, creating encoding ladders, per-title encoding).

► **Section 7. Miscellaneous Topics** (DRM, low latency technologies, QoE and QoS, content delivery networks, choosing a player).

► **Section 8. Producing VOD** (production overview, create your own or OVP/UGC, cloud or on-premise encoding, make or buy encoder, choosing a cloud encoder, encoding for uploading to OVP/UGC).

► **Section 9. Producing Live** (live production overview, transcode on-premise or in the cloud, choosing a live streaming service provider, choosing a live streaming encoder, connecting to your live streaming service provider).

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ACCESSING STREAMING MEDIA 101 COURSE MATERIALS

There are five ways to access the lessons in Streaming Media 101:

Via the Online Course - *bit.ly/StreamingMedia101*

Employees can buy the course online as normal and the company can reimburse. If the company makes a volume commitment we can issue a coupon code that allows employees to purchase at the reduced price. Alternative, companies can pay the Streaming Learning Center directly for the discounted price, and we'll issue coupons that enable employees to register for free (the preferred approach).

License for Use in Your Learning Management Systems (LMS)

Since many streaming media companies have their own LMS, we offer our course materials for licensing on a yearly basis. In this arrangement, companies identify the lessons they want to license, which we supply via an MP4 file, PDF file of relevant slides, and quizzes. The licensee integrates these into their LMS as they see fit.

Pricing is based upon the number of students who will take the training for each 12-month license period, with standard discount schedules applying. Licensees are entitled to all lesson updates and new lessons added to the course each year, which is important because we just added six lessons to Streaming Media 101 and updated another four.

Add Your Content and We Host

Some companies don't have an LMS but have enterprise-specific lessons that they want to add to our training, perhaps for specific encoders or packagers used or sold by the enterprise. In this case, we can either create the additional lessons for them or include lessons that they've created into the existing curriculum. We produce a custom course open only to their employees with progress monitored and certifications awarded only after completing all course modules and passing all quizzes.

Pricing is based upon the additional work that we have to perform and the number of students who take the course.

Live Remote Training

Travel and gathering in small rooms for many hours is dicey for many organizations, but training is still critical. For these organizations, we can train remotely over their webinar platform of choice, or GoToWebinar, which we license. Enterprises can select their own curriculum from lessons in existing courses, add lessons that they supply, or ask us to create additional lessons if needed.

Pricing is based on the number of students attending the classes, the duration of the training, and the number of enterprise-specific modules we have to create.

Local Training

Course creator Jan Ozer is now fully vaccinated for COVID-19 and available for onsite course delivery. Enterprises can select their own curriculum from lessons in existing courses, add lessons that they supply, or ask us to create additional lessons if needed. Pricing is based on the number of students attending the classes, the duration of the training, the number of enterprise-specific modules we have to create, plus travel and similar costs.

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ABOUT COURSE CREATOR JAN OZER

Jan Ozer
Course Creator

Ozer is a leading expert on audio/video encoding for live and on-demand production. He produces **courses** that help onboard streaming media practitioners and enhance their knowledge of a variety of topics. In his consulting practice, Ozer helps streaming publishers produce highly optimized and deliverable streams and choose encoders, transcoders, and workflows that optimize cost, efficiency, and flexibility.

Ozer is a contributing editor to **Streaming Media Magazine**, where he reviews codecs, on-premise and cloud encoders, and ancillary tools like QoE and QoS monitoring services. Skilled in video production and editing, Ozer also produces live events for streaming or on-demand viewing.

Ozer blogs at the **Streaming Learning Center** and is the author of over 20 streaming and video-related books, including **Video Encoding by the Numbers: Eliminate the Guesswork from your Streaming Video**, and **Learn to Produce Videos with FFmpeg: In Thirty Minutes or Less.**