Challenges and Opportunities in Nuclear Security Training Implementation During the Global Pandemic (#208)

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ABSTRACT:

In March of 2020, the world suddenly halted – quarantined and locked down from a deadly pandemic traveling swiftly around the world. Things were changing and the full impact to the nuclear security mission was not yet known. Would we travel in a few weeks? Would we see our international counterparts soon? Would our mission suffer? These and many questions were facing us, and longer-term problems were quickly facing our institution – problems that would require new strategies and thought. Communicating and conducting day-to-day business became challenging. Adapting become a critical requirement.

In the midst of the ongoing global pandemic, learning professionals have risen to the need, serving as solution providers and converting methods of face-to-face knowledge transfer to a necessary tool, "virtual learning." Although complicating matters were apparent, the conversion to virtual learning is not a simple step. Matters of *effectiveness* and *successful transfer of knowledge* must be part of the formula. Infrastructure (e.g., studios, video/audio capabilities) must be available and instructors needed new skills for delivering instruction and expertise.

The Nuclear Security engagement mission has served as a forerunner to conquering the challenges and succeeding in multiple ways. Nuclear Security instructional systems designers working with instructors and subject matter experts are succeeding in the new learning space by developing new content tools, exercises, and other engagements that can be conducted in a virtual delivery approach. Utilizing platforms such as Zoom, Webex, Microsoft Teams, etc. have helped teams to succeed in knowledge transfer. Even though our world halted, learning is still taking place and Nuclear Security programs are succeeding.

INTRODUCTION

The world has been thrust into pandemic conditions for more than a year now. Most office workers have been isolated in home offices or some other type of remote condition to avoid viral spread. Communities have been banned from gathering and treks for gathering essentials were recommended to be quick and limited. The pandemic imposed many constraints on a world-wide functioning society normally accustomed to personal interactions. The international nuclear security community is no different. Face-to-face engagements, relationships, conferences, and routinely established meetings have been the hallmark of effective collaboration and progress for the discipline.

It was apparent that adjustments were necessary, but we did not fully understand the extent of conditions. Over the course of weeks, conditions continued to devolve (maybe dissolve) and the need for adjustments continued to grow. Originally thought to be a short-term set of conditions – "two weeks to flatten the curve" became laughable as we settled into a new norm from weeks to months and unexpected longer-term conditions began to require sustainable solutions.

The short-term conditions included work-from-home arrangements, remote capabilities and file sharing, suspended travel, disruption of sponsor and customer interaction, school shutdowns, home and family challenges, and a host of other logistical and health constraints that complicated our world. But, again, this was to be only short-term circumstances and our lives and work conditions would soon return to the old normal. The challenge to adapt until things "returned to normal" became quickly apparent and the learning sciences professionals, along with nuclear security community partners, rose to the occasion and pivoted to remote engagement solutions. With this strategy came a new set of challenges to overcome that slowly revealed themselves as we waded into new waters. With a little experience, time forced a path of continuous improvement for this new method – improvements that would aptly prepare presenters, provide supporting production staff, reinvent delivery materials, overcome technology constraints in other countries, and effectively synchronize delivery teams in isolation.

THE SHORT-TERM TEMPORARY APPROACH

To address the immediate need for continuing international engagements and exchanges, video teleconferences using remote platforms such as Zoom, Teams, Kudo, and Webex were the obvious means for non-travel implementation. Resources were available to scramble remote events fairly quickly and plans and calendars began to develop for meeting scheduled goals. However, weaknesses and challenges began to surface as the details came to light.

Knowing nothing replaces face-to-face interaction, the team was still excited to venture more strongly into this latest technology frontier. We had the technology, most staff already were equipped with laptop cameras, content materials were available, and there was an enthusiasm for

making the adjustment. However, there were some obvious details to work through making the shift from planes, trains, and automobiles to video telecons (VTC) from home:

- Acquiring the right software and versions
- Ensuring access to the software for all stakeholders
- Raising the comfort level with unfamiliar tools
- Integrating translation requirements
- Pivoting learning staff to VTC production roles
- Securing HQ approvals for secure platform options
- Determining which tools met minimum requirements for given conditions
- Posturing target audiences having limited technology or isolation challenges
- Converting learning exercises to a different mode of delivery
- Strategizing how to minimize virtual fatigue
- Determining the legal implications or video-recorded events

The most unexpected complication materialized with the presenters – those who were so comfortably accustomed to in-person engagements and personal exchanges in a live setting with their international partners. They expressed their lack of skill at presenting remotely, using the platform tools, and instructing in a virtual environment. A new need materialized for preparing staff for camera events and interacting effectively without creating an unproductive one-way exchange. Presenter capabilities quickly became a critical concern and training was needed immediately.

Through effective partnering between HQ and the laboratory complex, virtual presentation workshops were quickly prepared and offered by experienced individuals. These workshops were presented virtually (and synchronous) and gave the opportunity to future presenters to develop and practice concepts in a safe space. Additionally, learning sciences professionals produced and distributed job aids with recommended tips for making the conversion; pivoting producers offered practice sessions with the new virtual tools to groom presenters for the new delivery platform and grow confidence with a coordinated team approach; translators were included for dry-run events; all staff rehearsed with break-out rooms for student exercises and “channels” were deployed to support varying language needs for given events.

Some early lessons learned from foreign partner engagements were identified for future application. From this feedback, emphasis was placed on the value of skilled production engineers and instructional system design experts to ensure the smooth and successful delivery of the event, instructor preparedness, and enhanced participant experience.

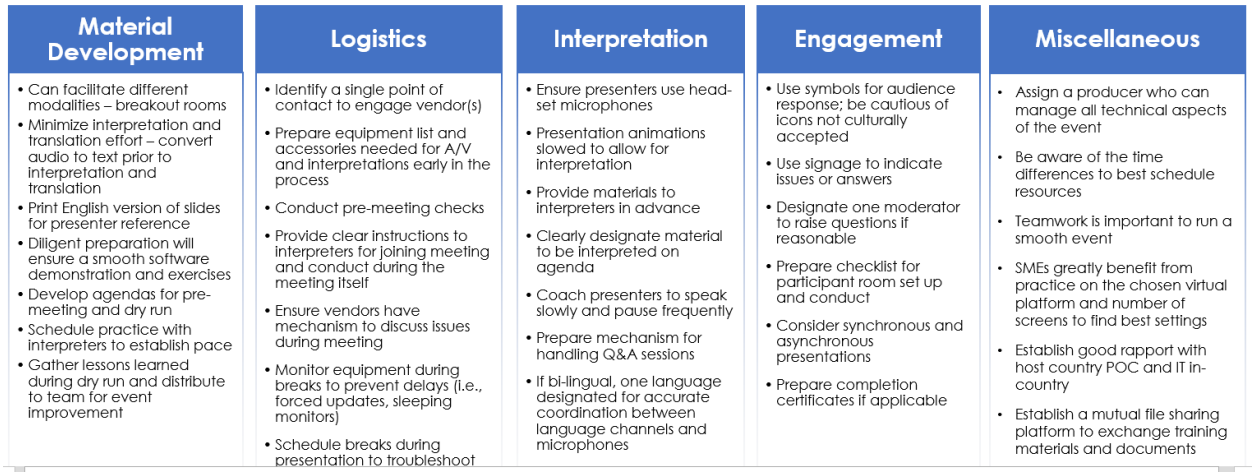

Figure 1. Virtual Delivery Platform Lessons Learned as gathered from INS events

The instructional systems design community quickly established some guidance for virtual platform selection and partnered closely with instructors, subject matter experts and other stake holders to ensure that communication with international counterparts continued.

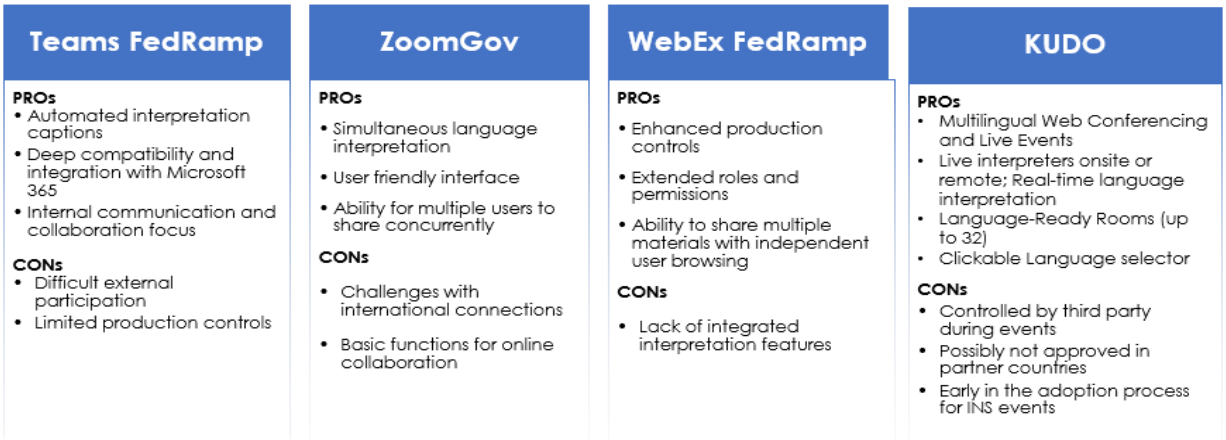

Figure 2. Virtual Delivery Platform Advantages and Disadvantages for use in the INS program

Supporting all six platforms being used by laboratories and foreign partners in the beginning days was not optimally sustainable. We needed to adopt a strategic approach of focusing programmatic and laboratory resources, efforts, and expertise on the platforms with proven international success. Optimizing a toolbox of the four most used platforms, *ZoomGov*, *Teams FedRamp*, *Webex FedRamp* and *Kudo*, contributed to the excellence of virtual delivery quality and effectively provided best-fit technology solutions to address foreign partner engagement needs. Due to rapidly changing technology (an attempt by vendors to adapt to current culture), features of each were a

moving target, and competitiveness was intense. This, however, ultimately benefitted the market over time.

What getting started feels like.

THE LONG-TERM PERMANENT APPROACH

Over time and as the pandemic stretched into lingering months, it became apparent that the short-term reality was evolving into a new normal – our business adjustments were no longer temporary and more permanent solutions were worthy of investment. We had become more successful at virtual delivery methods and as demand increased for virtual business, the market stepped up with emerging capabilities within the software tools. This expanded our possibilities and improved the experience for both learners and presenters. The result was a perpetual climb in scheduled events and resources were soon stretched to accommodate the growing demand.

Delivery teams would benefit from having actual eye contact for events within a shared space – a suitable studio would be ideal. Naturally, there were new trails to trod along with new challenges to overcome.

- Where could space be acquired quickly?
- How might distancing requirements be achieved?
- What are the benchmarks for a suitable studio?
- How quickly could the equipment be acquired?
- How costly would the space be?

- Would numerous studios be needed?
- How many production staff would be needed?
- Could arrangements be made to support so many off-business-hours events?

These were among many of the details to be sorted and resolved for navigating a high-demand nuclear security virtual community. Again, effective partnerships helped to quickly address the need. Space was acquired, benchmarking and research was performed, equipment was ordered, on-site studios were built with for social distancing, a formal production calendar was established, and the production crew became increasingly knowledgeable and adept at integrating and mastering emerging tools.

With time and growing experience, a rhythm began to develop across the nuclear security complex. Lessons learned from practice sessions at the various laboratories were noted and applied for continuous improvement and settling into a less manic and more reliable course of action. Reliability could be achieved as a result of:

- Dedicated studio space
- Ample equipment for maximum flexibility of application
- Trained, practiced, and comfortable presenters familiar with some experience
- Familiarity with tools and method options
- Conversion of course materials to virtual application
- Delivery strategies that would maximize live and synchronous time
- Applying a blended approach (e.g., integrate self-study, provide visual aids and infographics, break up delivery time)
- Redundant producer coverage
- Preliminary tests with the platform architecture and design plan
- Platform selection by understanding and maximizing their variable features
- Consideration of target audience constraints and needs

Management and sponsor support is critical to persevering in a successful virtual plan and the community was fortunate to benefit from such, paving the way for teams to explore, analyze, test, and implement. Of course, the growth came in stages, but ongoing support was attained through a common need to accomplish mission in spite of world conditions.

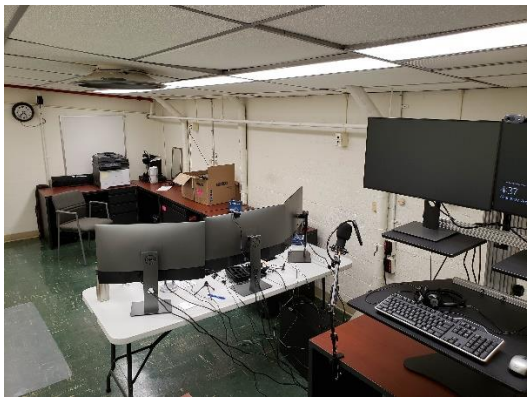

Figure 3. Early ORNL studio (Aug 8, 2020)

Figure 4. ORNL studio (Aug 28, 2020)

The early versions of studio set up were good and included the essential equipment for virtual production in an environment that collected presenters and producers in the same location. As experience was gained and demand increased, the studio evolved with sophistication. Adequate green screens were added, and improved video/audio tools and lighting techniques were applied.

Figure 5. Advanced ORNL studio (March 2, 2021)

Figure 6. Advanced ORNL studio (March 24, 2021)

Figure 6 best demonstrates the green screen effect and the depth it brings to a live, synchronous presentation. By spring of 2021, presenters were becoming more comfortable with the outlet and growing in ideas for maximizing performance and effectiveness.

SUSTAINING THE INVESTMENT AND THE EVOLVING FRAMEWORK FOR NULCEAR SECURITY TRAINING'S FUTURE

Although vaccination programs are beginning to indicate a soon emergence from the pandemic, a precautious society will not quickly return to the "old normal." We wade gently and slowly into the next phase, and with trepidation and careful thought about where our choices will lead and with consideration of the lessons learned in the past year. Investments in change have been made and successes realized that lead to more strategic approaches to nuclear security training going forward. Maximizing that which can be done remotely and virtually with effective results may be blended with in-person instruction and field visits, limiting costs and time abroad to activities that require outcomes not attainable virtually. (For example, practical exercises, route drives, field evaluations, and conversations that may not be appropriate for a recorded virtual event.)

The community is rethinking "Distance Learning." Often thought of as mere E-Learning, the methods can include much more. To *not* be in the same foot-space as the learner has its drawbacks, but society is growing accustomed to on-demand information and knowledge and is more primed for training venues that offer variety. With options for *synchronous* and *asynchronous* learning,

delivery methods can apply blended approaches with shorter instructional blocks. After a pandemic world, society has been groomed for more independent strategies and accepting of less social means for knowledge exchange. YouTube and internet outlets have provided high levels of intellectual food during the pandemic and altered our intake of news and awareness. Understanding these social phenomena should lend to our forward strategies in applying video productions through both synchronous and asynchronous deliveries.

Where should we aim as we emerge from a "stay home and stay safe" culture? What considerations much be pondered for varying country conditions as the pandemic subsides at different paces around the world? What were our lessons learned that are relevant for the future and return of a new normal?

- Collaborative and joint involvement across the Lab complex is important to secure knowledge and platform effectiveness
- Information sharing between stakeholders gaining experience is key to overall improvement
- Preparing presenters with skills in a different mode of delivery is a must
- Hold practice sessions with presenters to secure a level of comfort and establish a solid plan for each event
- Evaluate what can effectively be delivered in a virtual (distance) engagement and capitalize on the opportunity. Save in-field visits for objectives that cannot be met via distance learning.
- Establish skilled virtual producers who are comfortable with both technology and presentation delivery; ensure they are equipped to raise the confidence of presenters
- Evaluate the capabilities of your target audience to attend distance or virtual events; adjust engagements to accommodate partner constraints
- Optimize team interactions by establishing studios that accommodate the full production team. Eye contact between presenters and producers is important.
- Perform dry-runs and test connections in advance of each events
- Learn from others who are already experienced; take advantage of the community experience

CONCLUSION

While the COVID-19 pandemic created many challenges in sustaining nuclear security missions, the constraints forced on the world offered many opportunities for an abrupt change. Though the pace of change was not ideal nor comfortable for most, emerging from the global shutdown is proving that new methods and considerations should be part of our arsenal for accomplishing goals. We should consider "blended" approaches to engagement solutions – those that are appropriate considering the desired outcomes – and capitalize on the experience gained to date. While we continue to pursue excellence and to be effective with the resources afforded us, we now have evidence of another outlet that can contribute to successful solutions and knowledge transfer.

The community will need to continue with an investment in this delivery method. Tools will advance and equipment will become outdated, so it is imperative that we work to sustain the method and not abandon it as travel once again becomes viable.

ACKNOWLEDGEMENTS

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