BUILDING QUALITY BUILDERS: LESSONS LEARNED FROM SCALING A COMPANYWIDE TRAINING

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ABSTRACT

The fundamental purpose of this paper is to detail how a companywide educational training program has escalated in the USA and Europe in under 3 years' time. Details will include the many challenges faced throughout the process of developing the training structure and content, applying continuous improvement processes that are based off collaborative and integrated efforts, while simultaneously preparing new facilitators and maintaining program relevancy to the company culture and mission. The new virtual environment imposed by ever changing COVID-19 policies has created both challenges and innovative opportunities for the development of workplace training programs. The content of this paper builds on Arroyo and Gomez (2021) where the development of DPR Construction's Building Quality Builders (BQB) program was first explained and documented. The content of this document's focus will be aimed at voicing the escalating challenges, improved strategies, and trained facilitator perspectives that were utilized and shared to aid in the continued improvements of the Building Quality Builders training program. The depth of this research includes: the escalation process, communicating lessons learned within learning platforms, facilitator training, training impacts and ideas for improvement from the perspective of those who are performing the work.

KEYWORDS

Quality, Continuous Improvement.

INTRODUCTION & BACKGROUND

The struggle many organizations face with promoting change and building a culture of quality is no different. Developing training programs intended to provide employees with opportunities to learn new behaviors and new practices supporting a Quality Culture is important. However, the development is not enough to change the mindsets and actions if the training cannot be scaled throughout the organization. DPR Construction has more than 900 projects active at any given time, therefore making sure our employees understand the purpose and implementation of the DPR Quality approach is an ongoing challenge. This is true for DPR Construction and many other General Contractors,

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Paz Arroyo, Emilee Hinsley, Ralph Romayor, J.D. Nelson, Raj Komuravelli, Ellie Holland, Robert Tolle, and Stephen Terni

Architecture & Design Firms, and Trade Partner Organizations in the construction industry. This research focuses on documenting the escalation process that DPR Construction has followed with the hope that sharing our experiences will inspire new practices in other companies. DPR is a company that thrives from passion, innovation and continuous learning. By engaging outside of the organization, we can learn from other organization's experiences to inspire relevant research questions for academic partners and continuous development.

Building Quality Builders (BQB) is a four-week virtual workshop that was developed by DPR Construction between 2019 and 2020. It addresses the status quo understanding that Quality is a process that is done after the work in the field is complete to a mindset that project teams need to understand and align expectations throughout the project life cycle starting at the pursuit phase and continuing throughout closeout. By identifying Distinguishing Features of the work, aligning on Measurable Acceptance Criteria (MAC) and communicating effectively to everyone involved in planning and doing the work, rework will be avoided, which means the project can avoid recordable injuries, delays to the schedule and cost increases. *Arroyo and Gomez* (2021) describe in detail the development of the training content and the continuous improvement cycle to achieve the current version. The current version includes weekly pre-course homework and a one-hour instructor led conversation pertaining to the pre-work. The course is designed to intrinsically initiate DPR's quality culture approach by invoking passion and excitement within the course content. The primary intent of the workshop was to help participants create an action plan to implement DPR's Behavior-Based Quality approach (Spencley et al. 2018, Gomez et al. 2019, and Gomez et al. 2020) on their specific project jobsite. The workshop also initially intended to draw from the need for psychological safety in Quality conversations, training (Edmonson, 2012), and the need to improve communications using language action perspectives (Flores, 2012).

BQB continues to follow the Flipped Classroom Approach, where all learning material is available for participants prior to meeting with the facilitators. The course consists of short videos of DPR field teams presenting their project task implementation stories. These stories cover a variety of project types including small and large projects, different core markets, different regions and different perspectives based on a variety roles and responsibilities. The course provides a summary of key quality program tools including A3 templates for Distinguishing Features (DF), Quality Implementation Plan (QIP) templates, etc. Workshop participants are asked to dedicate 2 hours per week, totalling around 8 hours across 4 consecutive weeks. The commitment consists of 1 hour of pre-work (watching short videos, reading short documents, and answering 5 questions) and attending a 1-hour facilitator led team call where participants engage in a safe and productive conversation. In addition, participants are asked to attend a 1-hour follow-up facilitator led conversation held a month after the last session that allows everyone to share what they have been working on and what they have seen that needs to change.

The BQB workshop current agenda includes:

- **Session 1** -Why a Behavioural Approach to Quality?
- **Session 2** -Quality Language and Leadership
- **Session 3** -How to Apply the DPR Quality Approach? (Videos and materials include pursuit, pre-construction, construction, and post-construction examples)
- **Session 4** -Action Plan

- **Follow up** -4 weeks after session 4

The training started with 66 graduates in 2019, 169 graduates in 2020, 186 graduates in 2021, and 55 graduates in the first Quarter of 2022. The current escalation is evident; however, the continuing improvement process, challenges and overall benefits of corporate training are seldom documented in lean construction literature. Though there are a few exceptions such as Tsao et al. (2013), Hackler et al. (2018), Arroyo et al. (2019 and 2021) as well as some documented academic experiences in teaching lean construction, such as Nofera et al. (2015), Brioso (2015), Neeraj et al. (2016), and Cisterna et al. (2021). We found no published papers documenting the escalating of training in the Lean Construction literature, which directly ties to the DPR Construction Quality Culture. This paper aims to bring insight to the challenges and successes of scaling a companywide training, and to share the specific lessons learned at DPR Construction from a practitioner's point of view.

METHODOLOGY

The intent of this paper is to document a case study (Yin 2009) of the escalation of BQB, a corporate training program. The main research questions are as follows:

- How to use technological tools to discover and implement innovative corporate training opportunities when considering the challenges imposed by the COVID-19 Pandemic?
- How to prepare new BQB facilitators for the training content and commitment? How can we learn and grow from previous experiences? What are the risks?
- How is the escalation process affecting the efficiency and effectiveness of the training program?
- How new facilitators' perspectives provide value for continuous improvement of the BQB program?

This paper documents 1) the escalation process that DPR Quality Team followed based on direct experience from the authors; 2) the results in the number of graduates per year and region collected through our learning platform and be using Power BI, and 3) the program facilitator(s) feedback collected through a survey that was administered to all BQB facilitators. The surveys collected perceptions of the DPR learning platform, the facilitator's level of comfort in their role, and the BQB workshop impact on quality within the organization. The discussion includes a summary of challenges and potential next steps for the DPR Quality team.

ESCALATION PROCESS

Figure 1 shows the escalation process for BQB. The development, testing and early data collections about the workshop are documented in *Arroyo and Gomez* (2021). At the time of data collection, most of the BQB groups were located in the California Bay Area, with some groups focused on specific projects in the Southeast region and a few open enrolment groups in Europe.

Paz Arroyo, Emilee Hinsley, Ralph Romayor, J.D. Nelson, Raj Komuravelli, Ellie Holland, Robert Tolle, and Stephen Terni

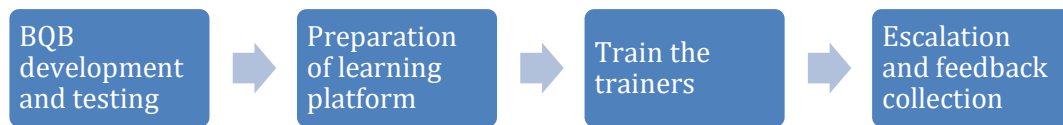| BQB development and testing	→	Preparation of learning platform	→	Train the trainers	→	Escalation and feedback collection

Figure 1: Escalation Process for BQB

The escalation seemed to peak during the second half of 2021. At this time the BQB workshop began offering the program 5 times per quarter, via 5 simultaneous groups, led by a team of trained facilitators. To complete the company rollout DPR relied on a new learning management software that provided timely pre-work (videos and questions), sent automatic reminders, and captured detailed participant answers. However, the learning platform presented its own set of challenges, such as invitations to webinar sessions not consistently being sent to all enrolled participants, and of course, the expected learning curve of understanding how to navigate a new online system. In addition to the new platform, facilitators and trainees used *Zoom* for the webinars, *Microsoft Teams* for sending workshop communication and *Microsoft OneNote* to organize and present the answers to pre work questions.

Each workshop group was led by 2 or 3 facilitators. The idea was to organize workshop groups so that at least one seasoned facilitator is present. The escalation and preparation efforts were supported by DPR's Learning and Development department. They provided feedback on previous escalation experiences for similar companywide training programs such as *Building Great Managers, Building Great Leaders, and Lean Leadership* (Hackler et al., 2018). The major finding, when examining lessons learned from previous training programs, was the need for facilitators to first be participants, then listeners, and finally take a more active role and facilitate the workshop.

To ensure success for the facilitators, DPR held a "train the trainer" session, where facilitators were asked, "What does it mean to be a BQB facilitator?". Additional discussions were held about the BQB training content, how to use DPR learning platform, experienced facilitators tips, coaching tools and additional virtual facilitation skills development. The top 3 facilitators tips discovered were the following:

    1) Start with the big picture on every session.
    2) Plan for who is speaking when (for participants answers)
    3) Listen and defer judgment.

Defining and communicating the facilitator responsibilities was crucial for the success of the training implementation. The following facilitator roles & responsibilities were identified:

- Promote BQB peer group meetings +
- Create Teams Group and tags
- Get answers from DPR Learning
- Read and highlight answers and decide who is talking when
- Summarize key points per questions
- Track attendance
- Keep track of time
- Capture Plus/ Delta each session

- Manage *Zoom*, share screen, create breakout groups, pools (optional), record and post sessions (optional).

- Help people with getting into DPR learning or changing sessions

- Send notifications to remind people to do pre work (*Microsoft Teams* and DPR Learning platform)

- Communicate with people that missed session or pre work and ensure they understand the consequences for incompletes (i.e., no credits without pre work, listen to recordings, ask to join a future session, etc.)

- Validate students that did pre work and attended at least 2 sessions, (they will in turn receive credit and the post-evaluation survey).

- The participant workshop data is derived from the pluses and deltas communicated at the end of each of the 4 workshop sessions, the post-evaluation survey, the action items communicated in the one month follow up session, and the Power BI Tracking dashboard (which shows enrolments and graduate details per region). The combination of these feedback loops allows the company to improve communication across different regions and to adapt training delivery strategies. It also provides a means of healthy competition between business units and regions, which has proven to encourage more participation.

BQB GRADUATE RESULTS

Figure 2 presents a graphical representation of Building Quality Builder graduates per region; the larger the circle the more graduates there are in that region. The largest circle is in the San Francisco Bay Area, because during the year 2019 and 2020 there were many sessions offered only in that region (prior to the National escalation process).

Figure 2: BQB graduates by geography.

Figure 3 shows graduates per calendar year. A total of 467 graduates companywide. That number increased significatively from 66 (2019) to 169 (2020) and 186 (2021) amounting in an overall increase of 182% in just two years. During the first quarter of 2022 there were 55 graduates. Notice that the year 2022 only represents graduates through March 2022. The number of graduates is expected to quadruple by the end of the 2022 year!

Paz Arroyo, Emilee Hinsley, Ralph Romayor, J.D. Nelson, Raj Komuravelli, Ellie Holland, Robert Tolle, and Stephen Terni
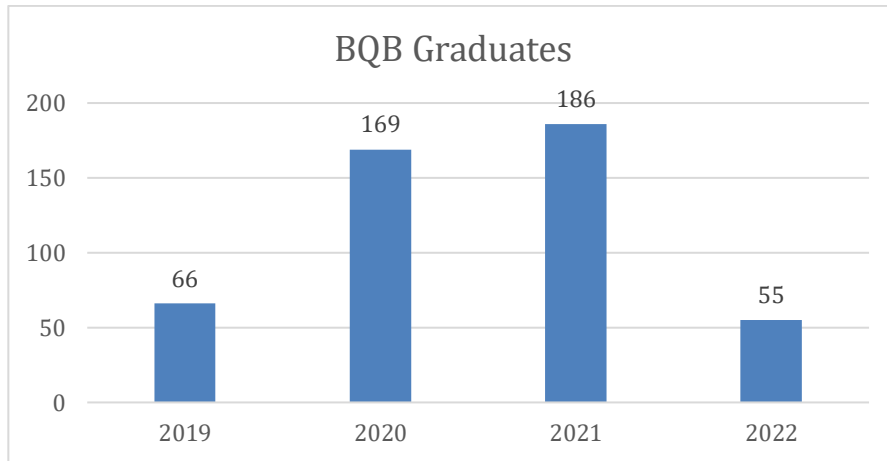

Figure 3: BQB graduates by year.

Figure 4 presents the number of graduates per year and region. The Northwest region led with number of graduates in the year 2020 and 2021. The Southeast region is leading so far in the year 2022.
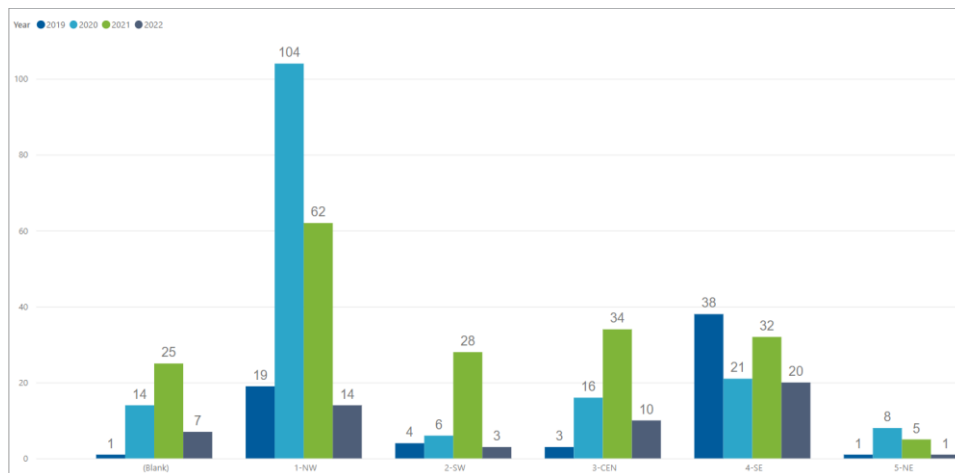

Figure 4: BQB Graduates per year and region (Blank represent Europe and affiliated self-performed work companies)

Figure 5 represents the graduates per job role. Most graduates are project engineers, project managers, and superintendents. Preconstruction managers and estimators have been participating in the workshop. Ideally, trainees from all phases of the construction process will take part in the Building Quality Builders workshop, as it covers quality concepts from project pursuit to closeout and turnover.
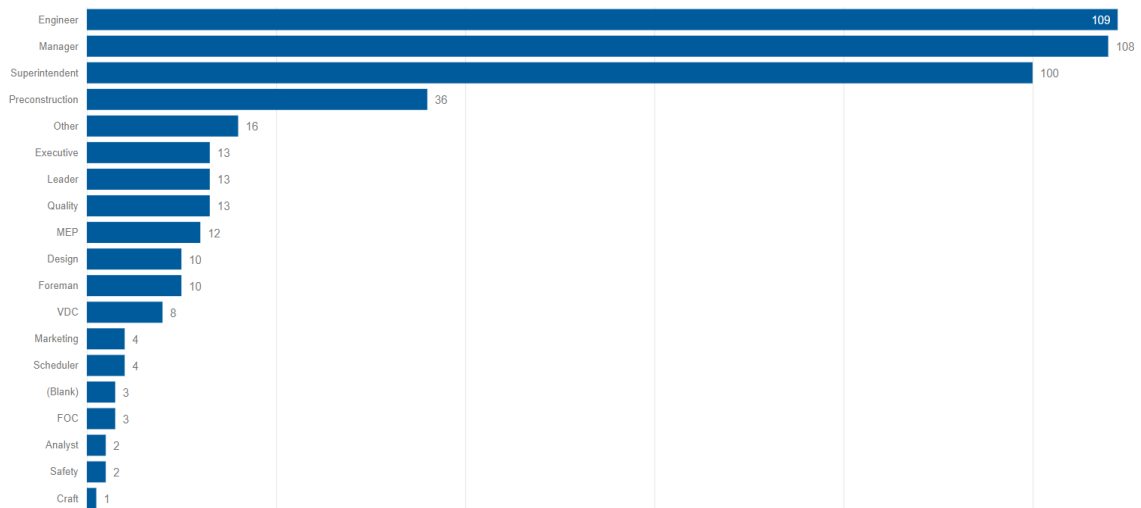
Figure 5: BQB Graduates per role

FACILITATOR FEEDBACK

According to DPR facilitators DPR survey learning platform pluses are:

- Pre work is easy to build
- Gives an overview of registered participants.
- Central location that people are becoming more comfortable using.
- Notifications for visibility to answers ready for review were useful.
- Response data is easy to export.
- Improvement over previous platform.

According to the BQB facilitator's survey, the DPR Learning platform deltas are:

- Export format isn't great, virtual sessions dates can't be changed within the platform. Limited number of video sources allowed
- The platform is very clunky and not user friendly. Any normal user will get confused on how to extract data. Also, I wish there was a better way to extract the responses from the platform so that the facilitator can export the data in the format needed to facilitate the session. There is a lot of time wasted by the facilitator on cut/copy/pasting of all the answers into OneNote, etc.
- Transferring information from the Learning Center to the OneNote that's used during the training
- It is very easy for a participant to accidentally drop from a course: the button to drop is right above/below the button to continue the training assignments, and there is no popup verification. It would be useful for the system to send reminders 48 hours before the session (so that participants complete coursework 24+ hours before the session
- Having to manually transfer BQB responses manually over to OneNote. Having to score each response individually. Difficult to use unless you know what to click.

Paz Arroyo, Emilee Hinsley, Ralph Romayor, J.D. Nelson, Raj Komuravelli, Ellie Holland, Robert Tolle, and Stephen Terni

> Not intuitive. Classroom link hard to spot in calendar invite. Having to use personal Zoom meeting link for classroom not ideal.

How can DPR learning and development resources ensure facilitators feel comfortable in their role? Facilitators mention what has helped them is:

- Time, experience of the material. Finding good co facilitator. Preparation for each session
- Experience
- Being on a team of facilitators where we can share the responsibilities for preparing for each session
- Built-in group discussions or talking points as part of the session OneNote

Facilitators need more support on (the facilitator comments are verbatim):

- I'd like more people to delegate to in Europe, will be looking for more co-facilitators
- I think I am all set except the comment on content I specified below.
- I think we do a good job of sharing successes between each group of facilitators, but it's typically after a full session has taken place. I think we can do a better job of sharing ideas as they're learned rather than waiting.
- Increase number of breakout group discussions, include more suggested talking points for each topic, better ways of gathering responses, better ways of getting participants to complete weekly coursework earlier

Making an impact! BQB facilitators think the most impactful workshop content has been:

- Teams developed mock-up rooms – Data Center Project in Europe
- Understanding DPR's approach to quality.
- We had a Project Manager in Houston who enjoyed the training so much, he has requested his new team be given an in-person BQB training session.
- Team members going through the example exercises and seeing immediate value in the DF discussions they were having
- It's rewarding to see past graduates encouraging other to participate but this is not common

Facilitators recommended areas of improvement to maximize workshop results:

- Add more practical tools and examples. Take some time to really concentrate on feedback for improvements in the business.
- The more we communicate the better. We have been doing a great job in making sure that people are aware of the sessions
- More application activities. People used to really like the DPR's "airplane activity" when we gave the Current Best Practices orientation, and it got the point across about asking the right questions from the right people.
- More example exercises and other ways for participants to practice skills related to the DF process

- Some participants have commented on the sound and production quality of the prework videos. Also, may be getting Business Units Leaders or Management Committee members to help create videos.

DISCUSSIONS

Based on the survey results, Pluses and Deltas meetings with BQB facilitators and company feedback, key findings and discussion points have been identified. Here the next steps are also discussed.

- **Company leaders have requested that the workshops are delivered just in time to project teams**. However, obtaining the resources to deliver this approach to hundreds of projects at the same time is very challenging. We have opted to offer 5 sessions per quarter and encourage teams to sign up in groups at a time that is appropriate for their project schedule. We are also exploring a self-paced version of the training where the project team can lead their own group.
- **Facilitators' tasks are very intensive, as described before.** In addition, many of the facilitators have a different role in the company, working on a project or another workgroup; the distribution of roles among facilitators is important.
- **Facilitation skills are hard to teach, what had helped facilitators was to work with a team and learn from each other.** Many of the facilitators also share personal stories and have a knowledge from current and past projects. In order to provide better support to facilitators, an internal adult learning specialist from the DPR Learning and Development department, will sit in (upon request) and observe a facilitator's session and provide direct feedback and guidance for growth and development.
- **DPR learning infrastructure allows for a more consistent experience to give prework and videos.** However, the current platform has presented many navigation challenges and learning curves. The BQB facilitation team is constantly passing on feedback to the Learning and Development department. With an increase in the drive to integrate with the L&D department, as well as other training facilitation teams, we are finding ways to reduce friction by sharing experiences and facilitation methods The feedback is also passed to platform developers to ensure continuous improvement from a software standpoint.
- While the initial focus was delivering the training to project teams, we have seen **benefits of open enrolment** to our pursuit, preconstruction, VDC, marketing and self-performed work teams. The ability for a diverse group of DPR professionals to join a training program has proven to open the doors to integration, networking and relationship building creating synergy and beginning to build a common language amongst the whole company. The only region that does keep a separate training is Europe, due to the time difference and with the large size of the US network making it not feasible.
- When reviewing the BQB training pre-work answers **we have seen consistent mentions of quality challenges and stories across the regions**. The answers prove that the behaviors, skillset, and mindset needed to communicate clearly and efficiently are sorely lacking across the board. Note that job role and geographical region are not contributing trends currently.

- **Keeping a variety of job roles in each BQB workshop has shown value to the graduates.** Often, they mention the importance of hearing diverse perspectives around what constitutes a quality work environment and culture. In the future DPR plans to expand participation from job roles that are closer to the field such as foreman and laborers. Further explorations are being made about what training programs should be offered to craft team members. There has also been a great deal of consideration around the opportunity to train architects, design partners, trade partners and even owners.

- **Some facilitators have been requested for in-person training on job sites**. A self-paced training has been developed as an alternative. However, there is a potential opportunity to have a shorter in-person training for project teams that want a Quality Kick-off and do not have time for the four-week training module. This leads into our continued understanding that the level of success achieved from attending a training program is very much dependent on the exterior factors (phases of the project, workload, personal life, etc.) our trainees are faced with daily. Timing is key in achieving maximum success.

- **Pre-work content has been (and continues to be) improved over time.** Construction is constantly evolving, which means training content should reflect real time industry changes. For example, many of the videos describe DFOW (Distinguishing Features of Work) and the Quality leadership team has since decided to change the terminology to just DF (Distinguishing Features). These types of inconsistencies can lead to confusion and in some cases distrust in the processes.

- **The scale of the training program should match the scale needed by the organization.** The Building Quality Builders program has been able to reach a scale where training is deployed across most or all geographies in which DPR is located; however, the program must now evolve again to ensure that the number of attendees who desire or could utilize the training matches the capacity of the program. The scaling process must always be evaluated to ensure what is being offered aligns with the needs of the organization.

CONCLUSIONS

The escalation of BQB has been well worth writing about! The expected total graduates for the year 2022 are over 200. The impact of engaged facilitators has been essential to developing continuous program improvements and to communicate the relevance of the training. When a new facilitator joins a new region or business unit word of mouth about the program seems to multiply. The data captured on the graduate map is proof of a regional increase in participation. New facilitators bring fresh ideas for improvement and additional experiences that make the training better, which adds to the innovation and ever-changing updates to the program. The recruiting and educating facilitators is an ongoing task in the process of escalation. Planning and allocating resources to support them in their own learning is very important.

In terms of escalation results, the Northwest California Bay Area still leads in number of graduates, as it was the first location to offer regular BQB sessions. The Southeast region, Central region and Southwest region are rapidly increasing their total graduates. Europe has also been increasing the number of BQB graduates and represents a bigger overall percentage of graduates, given they have fewer total DPR employees.

Measuring the real live impact of a training program is hard. Over the last 3 years DPR has collected many data statistics, facilitator program implementation stories and experiences, outcomes, and details from the one month follow up sessions and an overall perception from those providing the trainings. However, measuring actual savings requires more research, which requires more time and continued innovative efforts.

ACKNOWLEDGMENTS

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