

Final Report: World Plumbing Council Scholarship Travel to Rwanda

Submitted By Daniel Rademacher 2019 WPC Scholarship Recipient

Introduction

The World Plumbing Council (WPC) has been at the forefront of promoting and supporting plumbing industry education and training globally. As part of its mission, the WPC offers a prestigious scholarship to individuals actively involved in their local plumbing industry, particularly in the field of education and training. This one-time scholarship provides recipients with a unique opportunity to travel to another country, fostering an exchange of knowledge, exposure to different techniques and innovations, and the promotion of international recognition of plumbing competencies and standards.

This report documents the experiences and outcomes of the World Plumbing Council Education and Training Scholarship awarded to Daniel W. Rademacher. The purpose of the scholarship was to enable Rademacher, an experienced professional in the plumbing industry, to travel to Rwanda and contribute further to the development of plumbing industry knowledge and training. The report explores the goals and objectives of the scholarship, the significance of international cooperation in the plumbing industry, and the positive impact of the training program conducted in Rwanda.

Rademacher, currently employed as the Viega Trades Education Network (VTEN) program manager at Viega, LLC, possesses an extensive background in the plumbing/mechanical industry. A UA LU 41 member with 33 years of experience, including 28 years as a licensed plumber, Rademacher brings his knowledge and expertise to the plumbing education and training field.

The scholarship travel to Rwanda was accompanied by United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada Director of Plumbing Services and World Plumbing Council Chairman Tom Bigley and UA Director of Education and Training Raymond Boyd. It was initially scheduled for 2020, however, due to the worldwide pandemic the trip was postponed until June 2023. The visit aimed to support the efforts of the Rwanda Plumbers Organization (RPO) and contribute to the development of the plumbing industry in Rwanda.

Purpose of the Trip

The primary purpose of the scholarship travel to Rwanda was to support the RPO in enhancing plumbing education and training in the country. The trip sought to achieve the following objectives:

- a) Facilitate an Exchange of Information: The travel presented an opportunity for Rademacher, Bigley and Boyd to share their expertise and experiences with the local

plumbing professionals, including journeyman plumbers, instructors, and plumbing engineers.

- b) **Promote Plumbing Codes and Standards:** The trio aimed to emphasize the importance of adopting plumbing codes and standards in Rwanda to ensure safe and efficient plumbing practices.
- c) **Foster Collaboration:** The collaboration between international plumbing experts and the RPO was intended to foster a global community of plumbing professionals dedicated to the betterment of the plumbing industry worldwide.
- d) **Empower the Local Plumbing Workforce:** By imparting training and education skills to the local participants, the trip aimed to empower the local plumbing workforce, instilling confidence in their abilities.
- e) **Support Rwanda's Infrastructure Development:** With major infrastructure projects on the horizon, including the centralized sewer system in Kigali, the trip sought to prepare Rwanda with a skilled plumbing workforce to meet the demand for qualified plumbers.

The scholarship travel's delayed schedule provided ample time for preparations and refining the training program to ensure maximum impact and benefit for the participants in Rwanda.



Figure 1 First morning before training.



Figure 2 Bigley and Boyd discuss training with RPO founder Jean Claude Twagirimana.





Preparations and Training Program

Before embarking on the journey, substantial time and effort was invested in preparing for the Refresher Training Program on Residential, Commercial, and Industrial Plumbing Systems. Recognizing Rwanda's unique challenges and opportunities in the plumbing industry, the training program was tailored to address the nation's specific needs. This preparation involved researching the state of plumbing practices in Rwanda, understanding the local regulatory environment, and communicating with the RPO to ensure that the training aligns with its goals and objectives.

The training sessions were scheduled from June 26-30, 2023, and took place at the Rwanda Polytechnic/IPRC in Kigali. The event was expected to attract 80-100 participants, including journeyman plumbers, instructors, plumbing engineers, and government officials.

Training Title: Refresher Training Program on Residential, Commercial, and Industrial Plumbing Systems

Location: Rwanda Polytechnic/IPRC- Kigali, Plumbing Workshop and Classrooms

Facilitators: Tom Bigley, Raymond Boyd and Daniel Rademacher

Expected Number of Participants: 80-100, each day, more than 160 people attended the training.

The training program was designed to cover various essential plumbing topics, including definitions, drainage, venting, water supply, and more. The sessions would also focus on practical knowledge related to designing, installing, and maintaining sewerage systems, as well as the use of modern plumbing tools and equipment.

Training Topics and Objectives



Figure 3 Bigley makes opening comments.



Figure 4 WPC Chairman Bigley



Figure 5 UA Director Education & Training Boyd

The training program aimed to achieve several learning objectives for the participants in Rwanda. The topics covered during the training included:

Identifying Key Plumbing Concepts: Participants would properly identify different key plumbing concepts to develop a strong foundation in plumbing principles.

Designing, Installing, and Maintaining Sewerage Systems: Attendees would gain an understanding of sewerage system design, installation, and maintenance for residential, commercial, and industrial buildings.

Understanding Good Plumbing Practices: The training emphasized the importance of following good plumbing practices to ensure efficient and safe plumbing systems.

Piping Drawings and Isometric Views: Participants would learn to interpret piping drawings in orthographic and isometric views for plumbing system design.

Knowledge of Different Types of Piping Materials and Applications: The training covered various types of piping materials, their characteristics, and their applications in plumbing systems.

Applying Various Pipe Jointing Methods: Attendees would be familiarized with different pipe jointing methods and their appropriate applications.

Identifying Modern Plumbing Tools and Equipment: Participants would gain knowledge about modern plumbing tools and equipment, including their purpose, applications, safe use, and care.

Installing Water Service Component Parts: The training covered the installation of water service component parts for efficient water supply systems.

Performing Backflow Preventing Systems: Attendees would understand and perform backflow preventing systems to protect potable water supply.

Understanding Above- and Below-Ground Drainage System Design: Participants would learn about above- and below-ground drainage system design and installation.

Design, Installation, and Maintenance of Waste Water Treatment Technologies: The training covered the design, installation, and maintenance of waste water treatment technologies.

Understanding Gas Systems: The training provided insights into gas systems, including materials, excess flow valves, quick disconnect devices, testing, and sizing.

Understanding Water Heating Technology: Participants would gain knowledge about water heating technology, including specific definitions, requirements, ventilation, inspection, and sizing venting systems.

The training program's comprehensive content aimed to equip participants with a broad range of skills and knowledge required for the plumbing industry's diverse applications.

Learning Experience and Outcomes

Insights and Knowledge Gained:

The training program provided participants with valuable insights and practical knowledge that would significantly enhance their plumbing skills and practices. Topics such as definitions, drainage, venting, water supply, piping materials, and jointing methods were covered in-depth, allowing attendees to understand key plumbing concepts.



Figure 6 Bigley discusses the importance of plumbing licensure.



Figure 7 Boyd discusses the basics of plumbing education.



Figure 8 A member of the RPO expands on Boyd's comments in the Rwandan language.

Emphasis on Plumbing Codes and Standards

One of the key takeaways from the training was the importance of adopting plumbing codes and standards in Rwanda. The facilitators emphasized the significance of having a curriculum aligned with a specific plumbing code to ensure safe and efficient plumbing practices.



Figure 9 During the week after training, Rademacher, Bigley and Boyd were invited to a new residential construction project to view the plumbing rough in installation.





Figure 10 Bigley explains to the owner and members of the RPO the differences in accepted plumbing practices in North America compared to what he was seeing on site. This was the kitchen Sink rough in.



Figure 11 Soil stacks, waste stacks and water risers.



Figure 12 Soil and waste stacks.



Figure 13 Soil, waste and water lines. The line with a hole on top of the pipe was connected to a future water closet.



Figure 14 Water closet connection to back outlet water closet.



Figure 15 Sewage collection tanks. Tanks are pumped on a periodic schedule. A vast majority of Rwanda residential, commercial and industrial structures do not have access to public sewer systems and sewage treatment facilities.



Figure 16 Bigley speaks with the owner about the plumbing installation.



Figure 17 New residential home under construction.

Importance of Curriculum Aligned with Plumbing Code

During the training, the facilitators highlighted the challenges of teaching good plumbing practices without a curriculum aligned with a specific plumbing code. The RPO officers effectively organized a meeting with Rwandan government officials, who recognized the necessity of adopting a plumbing code for the country's future development.



Figure 18 Boyd explains apprenticeship programs.



Figure 19 Boyd and Bigley discuss the importance of training.



Figure 20 Twagirimana expands on the importance of plumbing education and training to the future of the plumbing industry in Rwanda.

Recognition of Qualified and Licensed Plumbers for Water Supply Protection

The Rwandan government officials acknowledged that qualified and licensed plumbers play a vital role in safeguarding the country's precious water supply. Properly trained and licensed plumbers were recognized as essential for Rwanda's infrastructure development and sustainable growth.

Imparting Training and Education Skills to Hosts:



Figure 21 A member of the RPO and local plumbing contractor brought fittings, pumps and other examples of plumbing items on the third day to help with the training.



Figure 22 Rademacher leads training on plumbing code sections.



Figure 23 Members of the RPO expand on comments from Rademacher for members in the class.



Figure 24 The gentleman in the coat and tie is Patrick, 71, a retired plumbing inspector and full time plumbing instructor for the college.



Figure 25 Students become engaged in the training.



Figure 26 Students crowd together to study the pumps and ejectors, as well as other plumbing fittings that were brought to class for display.



Figure 27 Class was over for the day, but many stayed to discuss the day's lessons.



Figure 28 Lunch with members of the RPO.



Figure 29 Handwashing station for the building where lunch was served each day.

Facilitating a Meeting with Rwandan Government Officials

The RPO officers effectively organized a meeting with distinguished officials of the Rwandan government. The facilitators highlighted the importance of adopting plumbing codes and standards for ensuring safe water supply and sanitation. The Rwandan government recognized the significance of a well-regulated plumbing industry for the country's future development.



Figure 30 Bigley, Boyd and members of the RPO meet with the Rwanda Standards Board to discuss the importance of adopting plumbing codes and standards, as well as the importance of plumbing licensure, training and education.

Support for Implementing a Plumbing Code

The RPO received support from the Rwandan government for adopting a plumbing code. The government officials acknowledged that qualified plumbers would be essential for the country's infrastructure development and growth.

Fostering Skilled Workforce for Rwanda's Infrastructure Development

The training program aimed to empower the local plumbing workforce with essential skills and knowledge. With Rwanda in the early planning stages for a centralized sewer system and other major infrastructure projects, the RPO's commitment to training and education would be instrumental in meeting the demand for skilled plumbers.

Benefits for the Plumbing Industry in Rwanda

Centralized Sewer System and the Need for Thousands of Plumbers

Rwanda, especially its capital, Kigali, with a population of 1.2 million, is in the early planning stages for a centralized sewer system. The successful implementation of such a system would require thousands of qualified plumbers to undertake this monumental task.

Addressing Training Needs for Future Generations

As Rwanda embarks on major infrastructure projects, the need to address the demand for trained plumbers becomes increasingly crucial. The Rwanda Plumbers Organization (RPO) is well-positioned to develop a skilled workforce and provide training and education for the next generation of plumbers.

Generation of Income for the Government Through Licensing Charges

Qualified and licensed plumbers will generate income for the Rwandan government through permit fees, fixture fees, and licensing charges. A well-regulated plumbing industry would contribute significantly to the country's economy.

The Role of World Plumbing Council Scholarship

Promoting and Assisting Plumbing Industry Education

The WPC scholarship played an important role in promoting and assisting plumbing industry education in Rwanda. By providing an opportunity for international collaboration and knowledge exchange, the scholarship contributed to enhancing the plumbing education and training landscape in the country.

Facilitating International Recognition of Plumbing Competencies and Standards

The scholarship travel to Rwanda fostered global recognition of plumbing competencies and standards. The collaboration between international plumbing experts and the RPO facilitated the exchange of best practices and expertise.



Figure 31 Local plumbing supply store. DWV pipe ready for delivery.



Figure 32 Local plumbing supply store.

Encouraging Exchange of Plumbing Industry Professionals

The scholarship travel provided an opportunity for plumbing industry professionals from different countries to come together and share their experiences, techniques, and training systems. This exchange of knowledge contributed to the overall advancement of plumbing practices worldwide.



Figure 33 Bigley and Twagirimana express encouraging thoughts pertaining to the future of the plumbing trade and industry.

Recognizing and Promoting Innovative Research

The scholarship program recognized and promoted innovative research in the plumbing industry. Participants in the training program were exposed to new innovations and techniques, fostering interest and exploration in plumbing research.

Developing Global Awareness of Plumbing's Contribution

The scholarship travel to Rwanda increased global awareness of the significant contribution of plumbing to society. By supporting the efforts of the RPO and providing training and education, the scholarship played a role in building a sustainable plumbing industry that benefits communities worldwide.











Figure 34 We are happy to report that our youngest student made all five days of training!

The RPO demonstrated its commitment to developing a skilled plumbing workforce to meet the demand for qualified plumbers as Rwanda embarks on major infrastructure projects, such as the centralized sewer system in Kigali.

The collaboration between international plumbing experts and the RPO fostered global cooperation in the plumbing industry, contributing to the overall advancement of plumbing practices worldwide.

Recommendations for Future Collaborations

The success of the WPC scholarship travel to Rwanda underscores the importance of international collaboration and knowledge exchange in advancing the plumbing industry. To build on this success, the following recommendations are suggested for future collaborations:

a) Continued Training and Education: Future collaborations should focus on providing ongoing training and education opportunities for the plumbing workforce in Rwanda. Regular workshops and refresher courses can help reinforce knowledge and keep professionals updated with the latest industry trends and practices.

b) Strengthening Plumbing Curriculum: Efforts should be made to develop a comprehensive plumbing curriculum aligned with international plumbing codes and standards. A robust curriculum will ensure that plumbing education in Rwanda meets global best practices and standards.

c) Encouraging Research and Innovation: Future collaborations should support and promote research and innovation in the plumbing industry. Encouraging local plumbing professionals to undertake research projects can lead to the development of innovative solutions and practices that benefit the entire industry.

d) Establishing Partnerships: Collaborations with international organizations, such as the WPC, can help establish partnerships with plumbing industry stakeholders worldwide. These partnerships can facilitate access to expertise, resources, and funding to support plumbing initiatives in Rwanda.

e) Enhancing Public Awareness: Efforts should be made to enhance public awareness of the importance of plumbing in safeguarding public health and the environment. Public awareness campaigns can help promote plumbing as a vital profession and encourage more individuals to pursue careers in the field.

Acknowledgments

The success of the WPC scholarship travel to Rwanda would not have been possible without the contributions and support of several individuals and organizations. Special thanks to the WPC for awarding the scholarship and providing the opportunity for Rademacher to travel to Rwanda.

Gratitude is also extended to the RPO for its collaboration and hospitality during the training program. The support and efforts of the RPO officers in organizing a meeting with Rwandan government officials were instrumental in promoting the adoption of plumbing codes and standards.

The participation of journeyman plumbers, instructors, plumbing engineers, and government officials in the training program was crucial in making the event a success. Their enthusiasm and engagement during the sessions contributed to the overall positive learning experience.

Rademacher, Bigley and Boyd were truly inspired by the people of Rwanda; Rwanda has emerged from a tumultuous history to become a beacon of hope and resilience. The people of Rwanda have not only overcome immense challenges but have also managed to build a vibrant and progressive society. We celebrate the positives of the Rwandan people, their strength, unity, and determination to create a better future.

The Rwandan people have displayed remarkable resilience in the aftermath of the 1994 genocide, one of the darkest chapters in modern history. Despite the immense tragedy, the people of Rwanda have shown an extraordinary capacity to heal and rebuild. The process of reconciliation has been driven by a collective determination to move beyond the past and create a united nation.

One of the most inspiring aspects of Rwandan society is its commitment to unity and reconciliation. The government has implemented policies and initiatives to foster a sense of national belonging and shared identity.

The story of Rwanda is one of triumph over tragedy, resilience in the face of adversity, and a commitment to building a brighter future. The Rwandan people have demonstrated that from the ashes of despair, a nation can rise with determination, unity, and a shared vision for progress. As we celebrate the positives of the Rwandan people, we are reminded that even in the most challenging circumstances, the human spirit has the power to overcome and thrive.



Figure 35 We were truly humbled when we were asked to lay wreath at the Genocide Memorial as a gesture of international peace and goodwill. We will be forever grateful for this honor.



Figure 36 The Eternal Flame that burns at the memorial in remembrance of the fallen.

We also would like to thank the RPO and our hosts for the wonderful hospitality we received during our visit. It was truly special being able to spend time getting to know our new friends in Rwanda and experience the culture in their great country.



Figure 37 Members of the RPO proud to show us Rwanda.



Figure 38 We were treated to a traditional Rwandan dinner celebration.



Figure 39 Local Rwandan plumber Jean Marie and Rademacher



Figure 40 Twagirimana, Boyd and Rademacher.



Figure 41 We were guests at a barbeque hosted by local Rwandan plumber Jean Marie at his home.



Figure 42 The future of the Rwandan plumbing industry!



Figure 43 Rwanda Strong!



Last but not least, Rademacher would like to thank Bigley and Boyd for their expertise and knowledge in providing valuable training and education to the participants in Rwanda: “I cannot thank both of you enough for traveling with me to Rwanda, it was definitely a trip worth taking and I would like to think the trip would have been a success if I had to go on my own but the support, commitment and dedication you provided was invaluable in making this training trip an overwhelming success. I appreciate all you do for the plumbing industry in North America as well as globally and I am truly grateful for your friendship.”

Conclusion

The World Plumbing Council scholarship travel to Rwanda in June 2023 was an unequivocal success, with profound implications for Rwanda's plumbing industry and the global plumbing community. The commitment of Bigley, Boyd and Rademacher as facilitators during the training program demonstrated the WPC's dedication to promoting plumbing education and training worldwide.

The significance of adopting plumbing codes and standards resonated throughout the training program, as the Rwandan government recognized its pivotal role in safeguarding the nation's water supply and ensuring public health and safety. Rwanda's future prospects for infrastructure development align with the critical need for qualified and licensed plumbers, and the RPO's dedication to training ensures a bright future for the country.

The trip to Rwanda offered Rademacher and his colleagues a unique opportunity to impart their expertise and knowledge to the Rwandan plumbing community. The participants' enthusiastic

response underscored the value of such international collaborations in fostering advancements in plumbing practices.

The knowledge gained from this transformative experience will undoubtedly impact Rademacher's work in North America, elevating plumbing education and contributing to the growth and progress of the plumbing industry. The ripple effects of this trip extend beyond the borders of Rwanda, shaping the future of plumbing practices worldwide.

The WPC's commitment to promoting plumbing education, training, and international cooperation has been exemplified through this scholarship travel to Rwanda. By recognizing innovative research, facilitating knowledge exchange, and promoting best practices, the WPC continues to be at the forefront of advancing plumbing practices for the betterment of society.



Figure 44 Bigley receives his Certificate of Appreciation from the RPO.



Figure 45 Boyd receives his Certificate of Appreciation from the RPO.



Figure 46 Rademacher receives his Certificate of Appreciation from the RPO.



Appendix:

Executive Summary

The World Plumbing Council (WPC) awarded Daniel W. Rademacher the Education and Training Scholarship in 2019. Due to the global pandemic, the scholarship travel to Rwanda was postponed until June 2023. The primary objective of the trip was to support the efforts of the Rwanda Plumbers Organization (RPO) and contribute to the advancement of the plumbing industry in Rwanda. Accompanied by United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada (UA) Director of Plumbing Services and WPC Chairman Tom Bigley and Director of Education and Training Raymond Boyd, the five-day training event at Rwanda Polytechnic/IPRC in Kigali aimed to enhance plumbing knowledge and promote the adoption of plumbing codes and standards in Rwanda.

The training program, titled “Refresher Training Program on Residential, Commercial, and Industrial Plumbing Systems,” took place from June 26-30th, 2023. The event was facilitated by three experienced professionals: Bigley, Boyd, and Rademacher. It attracted more than 130 attendees, including journeyman plumbers, instructors, plumbing engineers, and government officials. The training sessions covered various essential plumbing concepts, including definitions, drainage, venting, water supply, and more. Practical knowledge on designing, installing, and maintaining sewerage systems, as well as modern plumbing tools and equipment, was also emphasized.

During the training, the facilitators emphasized the importance of adopting plumbing codes and standards in Rwanda. The RPO officers organized a meeting with Rwandan government officials, who expressed support for the implementation of a plumbing code. The government recognized the significance of qualified and licensed plumbers in safeguarding the country’s water supply and developing its infrastructure. Officials acknowledged that a well-regulated plumbing industry would be crucial in providing safe, clean potable water, sanitation, and hygiene to future generations of Rwanda citizens.

The WPC scholarship travel to Rwanda in June 2023 was a remarkable success. The collaboration between international plumbing experts and the RPO proved to be beneficial for both parties. Attendees gained valuable insights into essential plumbing concepts, while the Rwandan government recognized the importance of adopting plumbing codes and standards for the country's future development. The RPO’s commitment to training and education will be instrumental in meeting the demand for skilled plumbers as Rwanda embarks on major infrastructure projects, such as the centralized sewer system in Kigali. The training event fostered global cooperation in the plumbing industry, contributing to the overall advancement of plumbing practices worldwide.

