# Mentoring and Oversight of Programmers across Cultures and Time Zones

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## ABSTRACT

The career path of a SAS® programmer often develops in one of two ways, either as a 100% full-fledged programmer or as a manager with little to no opportunity to contribute as a programmer. Jobs that provide the opportunity to do both are not always available, especially in the world of consulting. Fortunately, I had the opportunity to take a role as a liaison between clinical SAS® programmers located in Ukraine and a client located on the US West Coast, while also maintaining my own project responsibilities as a programmer. This liaison position offered me a chance to mentor Ukrainian colleagues and apply and develop my technical and managerial skills. This was a new model for the client and there was some apprehension about the time difference and the unknowns of working with a team from a global region they had no prior experience with. Through specific examples, this paper will identify the skills needed to manage any type of client relationship, regardless of the geographical distance between stakeholders, and the value provided by mentoring to both the mentors and mentees. Also provided will be support for the ideas that in our virtual world, time zone differences can be much less of an issue than anticipated and that there were many more similarities than differences between Ukraine- and US-based teams.

## INTRODUCTION

Throughout my 20+ years as a SAS® programmer, I never actively developed a long-term plan for my career. From my very first assignment, which was creating tables and figures that display tabular and graphical results of statistical assumption testing for clinical studies, my entire career has been as a clinical SAS Programmer. I have worked on all study phases of drug development (pre-clinical, first-in-human, efficacy and safety studies, post-marketing studies), mostly in the Women's Health and Ophthalmology therapeutic areas. I observed my programming colleagues as they pursued their paths into various areas: statistician, marketing, business analytics, programming manager, application development, expert SAS programmer. I have always, either consciously or subconsciously, sought-out roles that offered me the opportunity to have multiple responsibilities. At various times, I have had either informal or formal positions of management, but never as a full-time position. These positions included resource management, technical management, and personnel management. Although there are certain aspects of these management positions I enjoyed, none of them were jobs I was interested in doing full time. What I did like was the ability to help other programmers with their technical problems. I often learned as much about the technical problem as the person asking the question.

My introduction to SAS programmers in the Ukraine began in May 2012 when I participated in the technical phone screens of what was to become the first group of programmers who would support the European offices of one of our clients. I would continue my involvement with phone screens of prospective candidates as this group expanded. In September 2013, a Clinical SAS training program at a University in the Ukraine was created by Experis Clinical (Pirbhai 2015). In April 2014, I was invited to present an hour-long introduction on pooled data analysis to the students in the University program. I also repeated this presentation to the third class of students in May 2016.

As the first class of students was completing their studies in mid-2014, I was asked to participate in the mentoring program for selected students. I was excited for the opportunity to expand my interactions with the Ukraine group. This relationship later expanded as the client I supported in the US wanted to utilize Ukraine programmers to support their business. In this paper, I present what this partnership has meant to my career development, the value of the internships to everyone involved, and how working with individuals in different time zones has been effectively managed.

## MENTORING EXPERIENCE

In June 2014, I began my first mentoring experience with Ukraine interns who were previously students in our Clinical SAS University program. In this 12-week internship, four experienced programmers were

each paired with an intern from the University program.  The interns' project was to take an anonymized study from raw data to standardized data to final outputs (tables, listings, and graphs).  The goal of this internship was to give the student interns experience that would mimic industry project work.  We designed the project deliverables, interactions, and processes to simulate the type of work they would do with a client.  These included having the interns:

- Use specification documents for the data sets and the outputs.

- Consult the protocol, statistical analysis plan, data collection forms, and any industry standard documentation to complete their assigned tasks.

- Work in pairs (as source and validation programmers).

- Fill out tracking documents to show their progress.

- Complete validation documentation.

- Provide weekly progress reports in a group setting.

Each of the interns had direct access to a mentor.  Beyond answering project questions from the interns and performing code reviews to help them write clearer, more efficient code, each of the mentors met weekly with their interns.  A portion of time in these weekly meetings was used to talk about general topics (families, interests, hobbies, etc.) so that the interns could get more practice speaking conversational English.

Currently, we are now in our third year of the internship.  Every one of the interns has been enthusiastic to learn as they worked through the project we designed.  They have been pleasantly surprised by the level of informal communication with the mentors, something they are generally not used to in their interactions with teachers and professors.  In fact, this level of communication is a positive experience for the mentors as well.  We get practice working with non-native English speakers which improves our communication skills significantly.  If the interns do not understand something we have said, we have to think about more effective ways to express our meaning.  Many times this can be addressed by not using shorthand phrases and English idioms.

Another benefit to the mentors is the additional exposure to industry standards, in this case - CDISC (Clinical Data Interchange Standards Consortium).  Because the study used for the internship did not use current industry standards, the mentors had to build specifications based on these standards from scratch.  There were challenging concepts (e.g., last observation carried forward) and complicated derivations in this project that provided many opportunities to learn about these standards in greater detail.  As a result, the mentors are learning along with the interns.

## OVERSIGHT EXPERIENCE

In October 2014, two of the former interns who participated in the Clinical SAS program at the University began working with the client supporting projects in North America with oversight provided by a senior level programmer.  In mid-2015, the client expressed interest in a formal pilot process to use Ukraine programming resources to support multiple projects in North America.  The original number of individuals included in this pilot project was one Ukraine team lead, six Ukraine programmers (which was later expanded to eight) and two liaisons.  The Clinical SAS experience for the Ukraine programmers ranged from 0 years (those coming directly from the internship) to five years.

The primary challenge with this arrangement was how the communication would be managed between the client and the programmers, given the 10-hour time zone gap between the US West Coast (where the client was located) and Ukraine.  The liaison role was created to bridge the time gap; the liaisons, of which I was one, were senior-level programmers located in the US Eastern time zone.  The liaisons were initially expected to spend 20% of their time on oversight while also assigned 80% to their own projects (which were initially different than the projects the Ukraine programmers supported).  Communication between the client and the programmers was initially planned to be primarily handled using issue logs to track questions and answers.  In addition, a Ukraine team lead was appointed as an on-site manager in Ukraine.  Their responsibilities included first-level oversight of all the Ukraine programmers supporting the West Coast client.

**MANAGING THE OVERALL CLIENT RELATIONSHIP**

Many of the tools and processes implemented to manage the overall client relationship were similar to those used regardless of location of client and vendor. The Ukraine team lead and the US liaisons had internal weekly meetings and weekly meetings with the client programming manager to discuss assignments and resourcing. These meetings were essential to ensure that the projects were appropriately staffed and that both sides (the client lead programmers and Ukraine programmers) were working well together. These meetings also allowed us to understand the scope of the assignments and the type of work so that we assigned the right work to the right people. We also met as needed with client lead project programmers to get more details on upcoming work. All of these meetings were helpful so that everyone understood each other's roles and responsibilities and were kept informed of any matters that needed to be addressed.

Within the Ukraine team lead and the liaisons, it was essential that the oversight of the Ukraine programmers was divided up. Initially, we did have some cases where multiple people were reviewing the same output. This actually turned out to be a positive as we discovered different issues in the outputs. When we found issues, we communicated these back to the programmers with suggestions on how to avoid these issues in the future. As the project continued, we (the team lead, the liaisons, and the programmers) became more comfortable and we better defined our responsibilities to avoid overlap.

### Flexibility

In any industry, priorities often change and new projects come up with no forewarning. The projects supported by the Ukraine programmers were no different. While we made a concerted effort to keep programmers on the same project, this was not always possible. Due to the effective communication structure with the client, we were able to quickly move resources to higher priority projects. We discussed and decided on who would be the most suitable to work on these projects. Everyone (client management, client lead programmers, and Ukraine programmers) was very willing to work together when resources needed shifting due to competing priorities.

**MANAGING THE RELATIONSHIP BETWEEN THE CLIENT AND PROGRAMMERS**

At the beginning of this process, we did not know how the communication between the client programmers and the Ukraine programmers would evolve. As mentioned, we began by developing issue logs to facilitate communication between the lead programmers and the Ukraine programmers. The initial process was to have Ukraine programmers enter issues/questions into the issue log. The liaisons would enter responses to the questions or indicate to the client lead programmer that they would need to respond to the question. What we quickly realized is that most of the questions from the Ukraine programmers were questions I would have asked as a senior-level programmer. The programmers did an excellent job of researching the answers to the more routine questions by consulting with other programmers within their office. Not only were the questions of high quality, but the complexity level of the work was what often is assigned to much more experienced programmers. In these types of situations, you would expect to start with simpler assignments (data listings and summary tables). Almost immediately, they were assigned (and successfully completed) more complex programming tasks, such as statistical analysis of efficacy data and graphical outputs.

We also received positive feedback from the project statisticians on the high level of detail provided in the questions from the programmers. This reduced the back-and-forth conversation, resulting in more efficient resolution of questions. What also became apparent is the Ukraine programmers' attention-to-detail; they caught several issues in programs they had copied from other programmers (LaDouceur 2016). The types of issues they found were what I would have expected from senior programmers. They have been much more than "heads-down" programmers; they are very analytical in the work that they do.

We emphasized some of the checking the programmers could do to ensure high-quality output. This included the following:

- When modifying data sets, compare post-change versions with pre-change versions.

- When new data is received or changes are made to tabular or graphical output, compare the pre- and post-change versions.

- Cross-check numbers across similar outputs.

Despite the use of the word "oversight", there is a mentor/mentee relationship inherent in this arrangement. We try to spend time helping them learn new concepts and we give them advice on how to approach problems. The main point is that this relationship is much more collaborative than your standard manager/employee setup.

**Adaptability**

Everyone in the project had to be adaptable to the environment they were working in. All of us had to adjust our responsibilities depending on the lead programmer. Some lead programmers wanted to have direct interaction with the Ukraine programmers. Others wanted to only provide assignments through either the Ukraine team lead or the liaisons. On the other side, some of the Ukraine programmers had more experience and wanted to have more direct interaction with the client lead programmers. Our main objective is to meet the needs of the client, but we also tried to match up programmers with the right projects and the right lead client programmer to maximize the chances for success on the project.

## VALUE OF MENTORING TO MENTEES

It is worth restating the appreciation that we hear from the Ukraine programmers and interns for the amount of time we spend answering questions and providing review and guidance. They are benefiting from the experience of programmers who have worked in the industry for many years. For the interns and the programmers supporting US-based clients, having native English speakers for first-line support is helpful as they become increasingly more comfortable speaking English.

The project that the interns complete gives them a detailed look into the daily life of a programmer. We purposely created errors in specifications to test the interns' knowledge. We also purposely omitted items from the specs so that later on, they will realize that they need to go back and update something that they already thought was complete. This is very common in any type of programming, but is almost a daily occurrence in clinical programming. We want the interns to come away with a realistic view of clinical programming.

## VALUE OF MENTORING TO MENTORS

It is often said that one learns more by teaching others. This is very true in the mentor/mentee relationship. I have made concerted efforts to ask the interns and the Ukraine programmers about their thought process in how they approached a problem. I have learned that they are not afraid to try things, even if it might not work. I have been exposed to more programming techniques that I will use in my own work. We are also getting the benefit of information sharing from the other programmers who work in the Ukraine offices. Because they all work together so well, they do a lot of sharing of ideas and solutions to coding problems.

## IMPACT OF TIME ZONE DIFFERENCES

Despite the 7-hour and 10-hour differences between Ukraine and the US East Coast and West Coast client, respectively, there was no negative impact on overall deliverables and timelines. The use of issue logs was very instrumental in maintaining a good work flow. There were times when the client needed to be prodded to answer questions, but it never caused significant downtime for the programmers.

In my role as a liaison between the Ukraine programmers and our US West Coast client, the biggest drawback is the self-imposed expectation to be available from early in the morning to late in the evening. By the time I started work in the morning, the Ukraine programmers would already have been working for at least half of their day. I also felt the need to check my e-mail late in the evening to see if there were any requests (new assignments, comments or questions that may need some interpretation) from the client that needed to be addressed prior to the Ukraine programmers beginning the next day. This same concern also applies to the lead programmers on the West Coast and the Ukraine programmers. Our goal was to not extend their normal working hours. We wanted to show that this method of programming support could work without making changes to the normal working hours. There are always

circumstances that require working outside of normal working hours (e.g., responses to regulatory authorities), but we try to minimize them by planning ahead and shifting resources as necessary.

## SIMILARITIES AND DIFFERENCES BETWEEN UKRAINE- AND US-BASED TEAMS

As I hope this paper has demonstrated, the way that the Ukraine team works with our US-based client is very similar to US-based programmers. They have comparable SAS skills and the ways in which they interact (issue logs, e-mail) with the client is the same as how US-based teams interact. They also have some of the same frustrations, such as lack of details in the specifications (or no specifications at all). However, they are able to persevere and figure out how to move forward on a project in cases where the instructions are not clear.

The biggest difference between the Ukraine-based team and US-based teams is the level of collaboration among the programmers. This is primarily due to the Ukraine programmers being located in an office (there are two separate offices), while the US has embraced the remote worker concept. The remote worker concept has plenty of advantages, but it definitely makes working together and learning from each other much more difficult.

One of the other (obvious) differences is that the Ukraine programmers are not native English speakers. However, this becomes an advantage when reviewing documents and specifications. They study each word carefully so they are more able to find errors very quickly. I think this combined with their analytical background makes them great candidates for such detailed work.

On a more amusing note, one of the other big differences observed in the Ukraine programmers, seen most in the interns who came from the University program, was the excessive use of the LAG function. You can tell there was a lot of emphasis on the use of it in the programming classes. I have seen the interns implement very intricate applications of the LAG function that somehow produced the correct results. But, as we explained to them, it is just as important to produce code that can be understood. It is extremely likely at some point in time that someone else will either have to modify their existing code or use their code for another task. Because of the constant use of the function used in the interns' code, the mentors incorporated the pros and cons of using this function in a SAS programming presentation given to the interns. We explained that the LAG function can be very useful, but to not rely on it too heavily as there may be other functions or methods that may be more appropriate (and easier to understand).

## IMPACT ON MY CAREER AND PERSONAL DEVELOPMENT

From my standpoint, the mentoring and oversight positions I have described in this paper have provided me the chance to utilize and build managerial-type skills in a much more relaxed and fun atmosphere. The opportunities I have been given as a mentor to Ukraine interns and as a liaison to Ukraine programmers supporting US clients has allowed me to improve my communication, learn how to better resource projects, and assign tasks more effectively.

Most Ukrainians speak Russian and Ukrainian. As a result, I have also tried to learn some Russian. I only know some words, numbers, and a few phrases, but I think that gaining some insight into how they form sentences and their grammar rules improves my ability to understand them better.

From a personal level, I have many new friends and colleagues whose positive attitudes inspire me. Their enthusiasm and dedication is energizing.

## CONCLUSION

We never know where our careers will lead and the paths they may take. What we can hope for is the opportunity for assignments that allow us to apply the things we know, to learn and grow, and to share our knowledge and experience with others. My role as a mentor and as a liaison to Ukraine programmers has been one of the most rewarding experiences of my life and career so far. Although this was not a pure management role, the liaison role has many elements of management, technical support, and resource management, allowing me to gain more experience in these areas.

What is most impressive to me is the complexity level of the tasks that the Ukraine programmers have worked on during this project pilot. Despite most of the programmers having < 5 years' experience

working in clinical programming, they have worked on complex derivations of variables, statistical analysis, graphical outputs (e.g., forest plots), and integrated analysis. They are never intimidated by the assignments. If they do not understand something, they will research it and ask questions until they figure it out.

The benefits of mentorship and working with other cultures are not limited to the professional side of things. These relationships and their impact extend into our personal lives, making life richer and more interesting.

## REFERENCES

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