The Vision of Digital Intelligence for Postgraduate Education: Improving both Student Experience and Administrative Ease

by E. Alana James, Ed.D. (alana@doctoralnet.com) and David Leasure PhD (davidleasure@gmail.com)
April 11, 2017

Abstract

Postgraduate education is poised for rapid development and if Deans and administrators will embrace lessons from industry it can actually be a smooth transition. The cost of doing nothing is greater than it has ever been before. Hit and miss development has left Postgraduate Schools (PGS) with disjointed student analytics and student experience is not what it should be. The future of PGS cannot be envisioned exactly, but we know it involves human to human interaction, technology, and scale. The conceptual map provided by Digital Intelligence, mixed with agile process will allow a clear path to develop PGS innovation quickly.

The Premise of this paper is that it is time to move back into the strengths educators have always relied on and to design systems using technology to help higher education thrive, thereby upskilling large segments of the population in knowledge and social capital. When postgraduate education improves for the at-risk student, the systems are more successful for everyone.

The purpose of this report is to help Deans and administrators caught in the midst of change, develop rapidly by laying out a vision and the steps involved in its implementation. Postgraduate education may be seemingly caught by unmovable situations, but does not have to be. It is time for thoughtful leadership to agilely implement effective and efficient student experiences based on digital intelligence. Improvement starts with enhancing the student experience to be more clear, seamless, supportive-and-empowering while gathering rich information on the needs of students, faculty, and administrators. To serve this vision, an agile and integrated system of digital intelligence is needed. One that builds a data profile: a) from recruiting through enrollment, retention, course work, and professional development; b) from entrance through graduation and on to employment and c) one that keeps in touch with alumni.

Keywords

Higher education, postgraduate education, graduate education, digital intelligence

The Vision of Digital Intelligence for Postgraduate Education: Improving Both Student Experience and Administrative Ease

by E. Alana James, Ed.D. (alana@doctoralnet.com) and David Leasure PhD (davidleasure@gmail.com)
April 11, 2017

Introduction

Higher Education environments have much in common with other areas of enterprise as leadership struggles under pressure for continuous change while simultaneously meeting the daily needs of students, clients, or customers. This paper merges practical and hard-earned experience in large scale higher education (HE), online delivery, and the development of technology for postgraduate professional development with current wisdom from some of the biggest consultants across other industries. The concepts of digital intelligence and agile development did not start in the field of higher education, but they are considered here in that realm, specifically as they aid Postgraduate Studies (PGS).

We first consider three overarching problems that overlap on a daily basis in every PGS we know. Then we discuss digital intelligence and agile development as conceptual models and ask if, taken together, they are useful to be considered as a basis for evidence-based, strategic change management. Finally, we put forward potential first steps towards building an array of tools that not only immediately improve teaching and learning but also subsequently give the answers needed to move towards building student centered improvements to scale.

Three Problems Plague Postgraduate Education

Problem 1: Hit and Miss Development Has Left Graduate Schools with Disjointed Student Analytics.

Postgraduate students, staff, faculty, and deans all experience different levels of frustration with the current status quo. It is no secret that PGS offices continue to struggle with decentralized communication, evolving requirements by university administration and certification agencies, difficulty in producing just in time metrics, and constantly shortening timescales required for information. Long range planning and development come and go amidst daily workload requirements.

Gaps exist in data; equating to holes in teaching and learning processes and less than adequate student experience. We advocate the power potential in non-cognitive and well-being data collected and correlated alongside academic empirical evidence. We believe the pedagogical decisions derived from such analysis will advance the development of extra supports proactively rather than reactively. If, for instance, data allowed for postgraduate (PG) students could both be disaggregated to the level of the supervisor or committee chair and include personalized detail regarding their individual needs, these could be used to uncover success factors related to the mix of both. When compared to baseline performance, multi-level and multi-dimensional views of trends would quickly become critical to performance analysis and problem solving.

The current gaps in analytics are costly from a number of angles. Not only do they increase the likelihood of disengagement and decrease student revenue, but also lack of student-centered data may contribute to poor choices about the next technological investment. It is not an uncommon experience that expensive technological choices made just a few years ago, no longer meet the needs of the multiple stakeholders involved. Frequently the technology that works for the undergraduate systems cannot be easily tailored to PGS needs. Truly wise decisions using evidence cannot be made until we know more.

Problem Two: PG Student Experience Is Not What It Should Be

Recent data[1] point to the relevance of five variables[2] in measuring PG student experience. In order of frequency of reported frustration level, they are:

1. 58% have considered dropping out of their programs before finishing.
2. 49% report that work-life balance is a frequent frustration or challenge; enough so as to make them consider dropping out of their degree program.
3. 45% report that they do not find the type or kind of support they are looking for within the university structure more than twice a month; causing them to consider dropping out of their degree program.
4. 32% find university requirements, feedback from professors, or other communication ambiguous.
5. 21% and 15% agreed that there was tension between what is required by their postgraduate work and themselves in the areas of personal development and independence, respectively.

Problem Three: While the Future is Unknown, We Know It Involves Human to Human Interaction, Technology, and Scale

Visioning to 2050 is an impossible task, yet some trends clearly impact educational delivery and therefore our discussion of Digital Intelligence across the postgraduate student's lifecycle. Much centers on how to scale-up while preserving the closeness and caring nature involved in quality teaching.

- By 2020, some predict the web will be 80% video – this can allow the small clues gained in live interaction to go to scale. Video shorts and quick video-video feedback will add to both the complexity and the richness of this chain of development.
- Wearable digital devices will allow for instant notification of learning events or conversations while at the same time aggravating issues of focus vs distraction.
- Personal issues with distraction will make "hard focus" a marketable skill.
- Likewise, other marketable skills developed during postgraduate work will be rolled into the student experience in a much more conscious manner by university professional development.
- As the world needs more leaders trained in complex thought and problem solving, the array of business opportunities for Masters and Doctoral students expands; thus, creating the need to scale all solutions.[3]

Students born and raised with digital connectivity are intolerant of slow data delivery. In an age where all appears to be available and understood, systems that take weeks to deliver relatively simple metrics (let alone to give rapid feedback on assignments) appear archaic. Therefore, it is increasingly imperative that campus life mirrors the types of technology and data experience these digital scholars have taken for granted in all other areas of their lives. Technology needs to aid the professors who work with PG students to increase the efficiency of their work.

What is needed then is to reframe our PGS conceptual map and development process. To that end, we look to both digital intelligence and agile development to point the way forward.

---

[1] As of June, 2017, n=270 verified responses. Data are based on a population that was 5% Masters, 95% Doctoral students, 13% European, 75% US, 5% African, 3% Asia or Pacific Rim, and 3% South American, . NOTE: Any university administrator may ask for use of the instrument, which will be white labeled for their students and adapted to the population they wish to query. The %s reported here were for aggregate frustration levels 4 or 5.

[2] Developed by Susan Gardner (2010).

[3] Same source as footnote 1.

Digital Intelligence and Envisioning the Future of Postgraduate Education: Proof of Concept

Coined by Forrester as part of their "*Digital Intelligence Playbook*" (McCormick & Little, 2016), digital intelligence is defined as more than "a superficial attempt to revise web analytics"; it is a strategy that encompasses "comprehensive analytics based on a cohesive approach that combines technologies, a broad set of stakeholders and users, and multiple outputs spanning reports, data integrations, and a focus on optimization and direct action" (p. 6).

To test the merit of digital intelligence as a conceptual base for growth and development in the field of Higher Education, in general, and Postgraduate Education, specifically, we ask:

1. Where does this framework lead us in envisioning the future of the postgraduate office?
2. What advancements in the field of teaching and learning will it contribute to?
3. Is it pragmatic? Will it help us advance from here?

If pragmatic and applicable to advancing teaching and learning, an actionable plan would develop utilizing technology to build the appreciative vision below. It would: a) allow for planned integration across a variety of current and future digital vendors to meet the needs of the PGS office and that of all their stakeholders, b) ensure that educational leadership has personalized data as to the reasons for and driving concerns of their student body and that these data could be disaggregated in a manner that allows personalized services to develop at scale, and 3) work in such a way as to advance a level of ease of delivery in educational administration; heretofore undeveloped.

1. Where Does Digital Intelligence Lead Us? An Appreciative Vision at Three Levels…

Students have a seamless experience through a portal that connects them together and with mentors, faculty, and other supports. It gives them a personalized experience of co-creating their learning (as you would expect from a grad student) and regular, structured coaching. Everything they need to succeed can be found here.

Faculty experience an organized dashboard telling them how each of their students are doing; a way to communicate key messages to groups, triggered communication – like "congratulations on passing your exam!" – and integration of risk assessment that helps prioritize contact. It also has a unified set of notes from everyone who interacts with the student (ala CRM).

Postgraduate deans create a comprehensive tool to improve learning, progression, cost reduction, and innovation. By having data integrated from all systems as well as behavioral, social, affective, and cognitive information on each student, both personalized support and analytics for overall improvement are possible. If desired, layered faculty roles may be implemented to support students with mentors first (MS degree) and then with professors – but spending 80/20 on these two levels so faculty can take on more students. Professional development is offered across the lifecycle of the postgraduate experience aiming them toward the development of not only their research and graduation but onward to employment in non-academic as well as academic environments.

2. What Questions Drive the Investigation and Advance Efforts in Teaching and Learning?

Digital Intelligence utilizes groups of technology vendors to collect and manage data across the lifecycle of postgraduate education in such a way as to advance data transfer from one silo of student experience to another. At the same time, personalized information is collected and merged allowing delivery of a personalized set of on-demand responses to students throughout the PGS lifecycle. This vision requires management of what types and kinds of data will be collected and fed back. Pedagogically driven and student-centered, questions, data, and digital intelligence allow educators to advance regular programs and student experience improvement and that these improvements filter into the daily experience of educators as well.

The graduate experience is highly personal; yet little data is collected that captures the unique and intimate factors that frequently lead to the second level outcomes of why they respond to the stressors of the

five variables[4] (reported above) as they do. We believe that, without knowing these primary human motivational factors, educators will be singularly unsuccessful in taking practices to scale. The next 50 years require the best in educational leadership, which has always been based on an understanding of psychological principles as well as programmatic content.

Every PGS office will design their own questions to be answered across the student lifecycle, however the following may serve as an example. Please note that, while student experience drives most of them, it is not at the cost of profitability. Questions, the answers to which would lead teams of educators to improve program and degree designs along these lines, might include:

What does the postgraduate student individually expect from the university, its support, and the outcomes for the programs they enter?

When a postgraduate degree system becomes difficult or frustrating, what are the driving forces that keep students pursuing their goals?

Which aspects of postgraduate programming make students feel connected? How does this change for the special populations within each program?

How do students define support and what aspects of their postgraduate work feel the most supportive?

What do students need to be successful after graduation? How do the skills demanded by their postgraduate work translate to a world where they may enter employment in a job that did not exist a decade ago?

What value is being created for the student throughout the postgraduate program? What excitement? What pride? What challenge?

What are the specific ROI for each program and technological costs? How can postgraduate programs improve and simultaneously become more profitable?[5]

When postgraduate school leaders easily answer these questions and program improvement is driven by them, then the relevancy of graduate education will no longer be an issue at any level. The next question to prove digital intelligence as a conceptual model worth adopting is: "Merged with agile development, how does it help us get there?"

Agile Development: Pragmatically Advancing Steps toward the PGS of the Future

Agile developed in the software industry to meet the needs of cross-functional teams charged with bringing solutions to market; letting the customers try them in beta testing as the teams actively refined the product. Technology quickly discovered that early testing avoided long-term implementation cost and other issues and allowed the customer experience to drive positive outcomes.

Agile, rather than linear development, is needed in Higher Education and PGS offices. Much like the chicken and the egg, technological solutions develop and then questions are asked, driving further development. Some ideas may not work; so, the astute team tests an idea to see if and to what extent it functions with students/faculty and in advancing systemically towards goals, before committing to wide spread

[4] Ambiguity, work-life balance, independence, development and support (Gardner, 2010).

[5] This last question is the driver for the next article in this series by David Leasure, PhD, outlining the systems within the university and ?????

adoption. The results are less overall disruption to services and more comprehensive outcomes.

In order to develop digital intelligence for PGS, it is necessary to consider the stakeholders and the reports required. The step-by-step processes through which to evolve agilely include:

1. Determine the need for a seamless experience and where the pain points are.
2. Use Appreciative Inquiry to create shared vision and demand for what could be.
3. Build an array of services. Investigate off-the-shelf systems to support a configurable and seamless experience for students, faculty, and administrators; one which addresses the pain points and integrates the data from legacy and vendor subsystems to support further analysis. Be aware that vendors may have a good outcome on the single issue, but their technology may not easily transport data to others.
4. Implement initial system with core functionality (minimal, viable product in agile terms) end-to-end within a department or program to contain unintended consequences while refining understanding of what will help the system be more effective and efficient.
5. Iterate on three areas: adding functionality at each iteration; keep parties apprised of benefits and progress to ensure change adoption within the pilot, and shifting to others as success deemed likely.
6. When proven beneficial, effective, and efficient, broaden to other departments.
7. Continue collecting rich data and planning upgrades.
8. A similar cycle applies to connecting to analytics, if that is not built into the platform. And some proof of being able to overlay an experience layer on top of legacy is needed.

First Steps You Can Do Today

Having determined that digital intelligence, developed agilely, advances our thinking conceptually and practically, the next question to answer then becomes, "What is available now? Who would be our industry team players in this development process and how would we work with them?" "If a back and forth agile development process would advance the work fastest, then where do we start?"

For that let's consider an array of service across the PG student lifecycle.

Building an Array of Integrated Components

The lifecycle of students is similar throughout a university. To use a water analogy and looking at it from the PG student's point of view, it starts with information (now usually the website), flows to enrollment, admissions, financial aid, registrar/transfer, courses, comprehensives, committees, defense, and graduation. Each of those is a potential island of data, which needs to be connected by a bridge or helicopter rather than paddle boats. In an ideal world, the data and services present a single web system that collects data as it serves student and faculty needs, yet is adaptable enough to work no matter the degree program for which any group of postgraduate students are enrolled.

Postgraduate education is not the same as undergraduate. The array of services needed for PG students include extra steps at recruiting, admission, at the bridge to candidacy for the doctoral candidates, comps and committee work, etc. Professional development services advance independent scientific skills and academic writing as they prepare graduates for transferring expertise developed in the thesis or dissertation to non- academic employment. Finally, PGS are potentially profit centers that need to be kept at the forefront of decision-making, even as a majority of PGS deans find themselves leading from a decentralized position. Clearly, having an array of metrics developed for PG, rather than for undergraduates, is important.

Assuming the vendors understand and adapt for these differences, an integrated system of technology should allow the various stakeholders to continue their normal work, while at the same time building a consistency and efficiency that are needed to centralize key performance indicators and feed them back to stakeholders on an on-demand basis for strategic planning. Figure 1 outlines the current array of Software as a Service (SaaS) offerings on the top half and, on the bottom, envisions the questions posited earlier and which type of vendor could easily ask them.[6]

[6] Return on investment and how to calculate it in complex university situations is the focus of another paper by co-author David

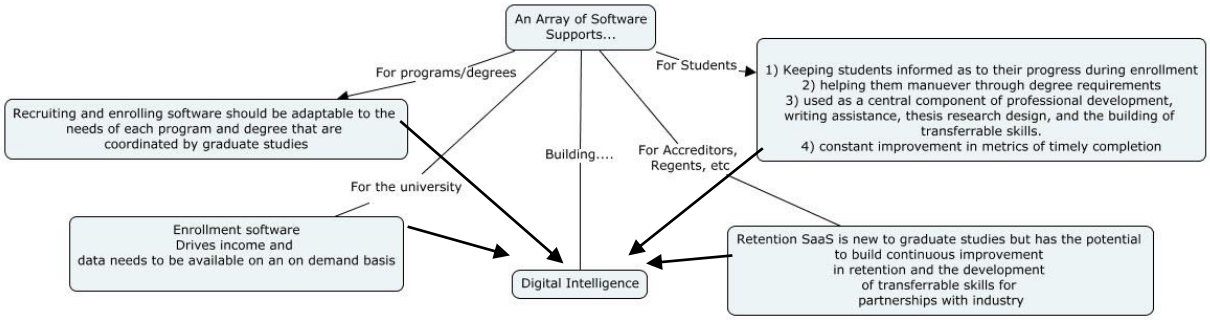

Figure 1: An Array of SaaS across the Graduate Student Lifecycle

The value is that at each handoff across the array, there is a dip possible in the transfer of understanding about the student experience. For example, the student who is recruited but does not enroll or who makes it out of proposal hearing but never turns in their dissertation or thesis. Measuring the flow-through rate, from lead to applicant, enrollee, matriculation, course taker, etc., sets a baseline that can then be managed by individual departments. At the same time, administration still views the whole and areas of non-growth or decline can receive a prioritized focus. When this correlates across student well-being factors, HE approaches its goal of taking all levels of support, even for the 1st generation, older, working, under-represented, student, to scale.

At a deeper administrative level, it also is possible to equate cost data to each pipeline and handoff of data, and to substantially influence ROI through student retention and success measures. For example, $/lead, $/matriculate, faculty-student ratio, staff-student ratio, etc.; all help manage costs. A potent CRM system, one with open API, allows issue tracking including resolution, aging, volume, and analysis of hot spot service failures, etc.[7]

Use Technology to Ask Better Questions

Table 1 below outlines the student lifecycle, where the questions posed earlier can be asked, and which vendors could add those questions. These in turn could reside in a CRM or data warehouse system from which the university can investigate the aggregate data and drive improvements in professional development first, and long-term program improvement over time. Some questions could be asked at multiple points in time, tracking changes in expectations as the student matures in the PG process. To illustrate the point, we demonstrate with the questions we posited earlier.

Table 1: Outline of Student Lifecycle/Questions to Drive PGS Improvement and Vendors

Student's point in postgraduate lifecycle	Questions to be asked to ensure academic excellence from student's point of view	Vendor or office able to collect that intelligence/data
Recruiting	What does the graduate student individually expect from the university, its support, and the outcomes for the programs they enter?	CRM system set up and adapted to different programs
Enrollment	Which aspects of graduate programming make them feel connected? How does this change for the special populations within each program?	Enrollment built on CRM to track entire process and deliver just in time data that catches points that slow down the process.
Program	What does the graduate student individually	CRM interface with faculty

Leasure.

[7] These metrics develop specific to the particular university context – for more information write

Attendance and Grades	expect from the university, its support, and the outcomes for the programs they enter? How do they define support and what aspects of their graduate work feel the most supportive? Which aspects of graduate programming make them feel connected? How does this change for the special populations within each program? What are the specific ROI for each program and technological costs? How can programs improve and simultaneously become more profitable?[8] How do they define support and what aspects of their graduate work feel the most supportive?	knowledge and retention SaaS. Includes polls with single questions when students sign in and these data merge with faculty well-being ratings.
Professional Development	What does the graduate student individually expect from the university, its support, and the outcomes for the programs they enter? When a graduate degree system becomes difficult or frustrating, what are the driving forces that keep them pursuing their goals? How do they define support and what aspects of their graduate work feel the most supportive? What do they need to be successful after graduation? How do the skills demanded by their graduate work translate to a world where they may enter employment in a job that did not exist a decade ago? Which aspects of graduate programming make them feel connected? How does this change for the special populations within each program? What value is being created for the student throughout the graduate program? What excitement? What pride? What challenge?	Pedagogically driven online system queries students with polls as they sign in or log-out. Professors also raise questions, as part of professional development, in webinars, email responses, and through surveys.
Committee Interaction	When a graduate degree system becomes difficult or frustrating, what are the driving forces that keep them pursuing their goals? What value is being created for the student throughout the graduate program? What excitement? What pride? What challenge?	Committee reports add the understanding of student wellbeing.
Interactions with PGS Office / Library etc	How do they define support and what aspects of their graduate work feel the most supportive? What are the specific ROI for each program and technological costs? How can programs improve and simultaneously become more profitable?[9]	Satisfaction surveys become the norm – were they satisfied with their service today? These are augmented by single question polls. Targeted weeks track staff and faculty time on task for ROI.

[8] This last question is the driver for the next article in this series by David Leasure, PhD, outlining the systems within the university and the provost's office

[9] This last question is the driver for the next article in this series by David Leasure, PhD, outlining ROI for the systems and

As said earlier, complex systems need to be built in an agile environment, one that meets current priorities and evolves iteratively, incorporating learning as it progresses while managing risk at each step. Someone looking at Table 1 might respond, "We can't possibly do all that." However over time and in small chunks, agile development adapts to the speed up/slow down delivery timetables, and makes room for new technological development and perspectives along the way.

Some people are driven by a vision of a desirable future while others by the raw need of a disaster looming. Perhaps, the smart educational leader of today builds a strong case for both and then plays them as necessary because for most PGS offices, in fact most universities, both are true. It helps to start with a sense of urgency such as a university goal to increase rank, move up a tier in the Carnegie classification, and take on new levels of certification or status, not to mention become profitable enough organizations to fund innovation and development.

Conclusion

In order to move past the previous hit and miss mode of bringing technology into PGS, to improve the PG student experience, and to begin to develop towards a future we can only partially imagine, Digital Intelligence is a concept worth consideration. We conclude that, mixed with a philosophy of agile development, it helps us envision the blend of technology and teaching and learning environments that should allow us to move to student-centered educational processes at scale. Pragmatically building an array of technology across the PGS student lifecycle, having the vendors of technology ask the questions we need answered for development and then proceeding in an agile manner with integrated analytics will promote fast and productive PGS change and innovation.

The overarching unanswered question, as stated by one provost recently, was, "How can we build on our history as a caring, student-centered campus, while taking all of our services to scale in a manner that is sustainable economically?" Finding vendors willing to partner with universities on this journey is the first step.

Included below are brief descriptions of technology vendors willing to take these steps and partner with universities to improve PGS overall.

technologies within the university

Bibliography

Barabasi, A.-L. (2002). *Linked: The new science of networks*.

Boyd, D. (November 2, 2007). *Information access in a networked world.* Paper presented at the Pearson Publishing, Palo Alto, California.

Christensen, C. M., & Eyring, H. J. *The innovative university: Changing the DNA of higher education from the inside out*: Wiley & Sons.

Daley, B. J., Watkins, K., Wall Williams, S., Courtenay, B., Davis, M., & Dymock, D. (2001). Exploring learning in a technology-enhanced environment. *Educational Technology & Society, 4*(3).

Granovetter, M. S. (1995). *Getting a job : a study of contacts and careers* (2nd ed.). Chicago: University of Chicago Press.

Hamman, R. Introduction to virtual communities research and cybersociology. (Magazine Issue Two.).

James, E. A. (2017). Retrieving graduate revenue from the edge: Solving inequitable socialization for Masters & PhD students with graduate technology support platforms. *Organizational Development, 35* (1), 67-83.

Kirkwood, A., & Price, L. (2013). Technology-enhanced learning and teaching in higher education: what is 'enhanced' and how do we know? A critical literature review. *Learning, Media and Technology, 39*(1), 6-36. doi:10.1080/17439884.2013.770404

Klemke, R. (2013). Technology Enhanced Learning. Multimedia presentation for elearning conference Belgrade.

McCormick, J. & Little, C. (2016, February). *Optimize customer experience with digital intelligence. Vision: The digital intelligence playbook*. Cambridge, MA: Forrester Research Inc.

Oblinger, D. G. (2009). *Technology use in graduate education*. Paper presented at the CGS Annual Meeting, San Francisco, CA USA.

Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: improving decisions about health, wealth, and happiness*. Boston, MA, USA: Yale University press.

Appendices: Technology Companies

Want to see these ideas in action? Enrollment RX hosted the University of Las Vegas in a webinar June 2017. Here is the link: https://www.enrollmentrx.com/resources/demos-videos/

Enrollment Rx is a higher education technology company delivering innovative Constituent Relationship Management (CRM) solutions for the entire student lifecycle. Built on the Salesforce platform, Enrollment Rx puts enterprise-class functionality and limitless scalability within reach of any size school or program. Academic institutions rely on Enrollment Rx to eliminate business process inefficiencies, maximize constituent engagement, and future proof their technology strategy. For more information contact: info@enrollmentrx.com or phone 847-233-0088.

Technology Focused on Professional Development, Completion, Publication and Being Prepared for Non-Academic Employment Post Graduation Exclusively for Postgraduate Students

MastersNet (MN) and DoctoralNet (DN) platforms are white-labeled for their university partners, providing an instant upgrade in student professional development through state of the art, online services 24/7 365. Billed on a per year per student who adopts usage basis, MN and DN frees up the postgraduate program from fears of not reaching all their students, not properly serving students at-risk of non-completion, or from difficulties that arise due to variance in engagement by supervisors or committee chairs. For more information contact: E. Alana James, Ed.D. alana@doctoralnet.com or phone 720-505-8145.