Increasingly, over the past two decades, industry, government leaders and the public have decried the state of affairs in higher education. The general consensus is that institutions are not preparing students to meet the demands of the next century. In response, faculty on college and university campuses nationwide find themselves in the midst of efforts to re-engineer their curricula and re-engineer the conduct of instruction. Frequently overlooked in this sea change of re-engineering efforts, however, is the vast amount of knowledge now needed by faculty to bring about the complex outcomes now desired for students. Hence, realizing the hopes of current restructuring efforts hinge on a major investment in faculty development - yet not just more of what we’ve always done - a different kind of faculty development is needed. This need led to the creation of Project LEA/RN (Learning Enhancement Action/Resource Network), an innovative faculty development project designed to improve learning and teaching in the College of Engineering at Iowa State.

Project LEA/RN traces back to the year 1993 and to the efforts of 18 faculty in the Department of Mechanical Engineering. Noticing discrepancies between the characteristics of students the program was graduating and the attributes demanded by industry seeking to hire those graduates, this group of faculty formed a study group to develop and implement instructional strategies to better prepare graduates for industry. To this end, group members met regularly to read articles and discuss issues pertaining to engineering education.

In the spring of 1994 their quest to transform engineering education brought several members of the study group to a university-sponsored faculty retreat about teaching and learning. While at this retreat, they met and solicited the assistance and expertise of a professor in the College of Education who shared their vision for student learning and agreed to facilitate the group.

Now with a stronger sense of identity and renewed commitment, these faculty next sought recognition and support from the administration. In particular, they approached the university with a bold proposal to test three simple hypotheses: 1) that faculty want to be effective teachers; 2) that faculty will devote time and effort to improve the effectiveness of their teaching; and 3) given the proper opportunity and support faculty will make rapid progress. The university response was favorable and in the fall of 1994, TAG, The Teaching Action Group (soon to be called Project LEA/RN) was launched with nominal financial support of the College of Engineering and Education as well as the Center for Teaching Excellence and the Provost office.

Four years ago no one would have anticipated the multiple roads down which Project LEA/RN would travel nor the impact the project would have. Project LEA/RN has grown in numbers from 18 to 150 faculty and has expanded from the Department of Mechanical Engineering to include faculty from nearly all colleges across campus.
As did the original group, participating faculty meet bi-weekly throughout the year for two hours in large group sessions (12-18 faculty) to investigate learning and teaching. Faculty learning is also supported by extended opportunities (learning partners, smaller base groups, and individual assignments), a feature of the project which also stems from the original model. As the project has grown, advanced workshops and special-topic sessions have been added. These are open to interested faculty (and administrators) and are typically offered during the winter and summer breaks.

Faculty accomplishments in the classroom, the overall growth of the Project, and the positive reception on campus enjoyed by Project LEA/RN all point to the success of the effort and demonstrate the effectiveness of the LEA/RN approach as a mechanism for achieving institutional change. Convinced of the of the need for broader conceptions of faculty development, like those embodied in Project LEA/RN, we describe here several principles for successful faculty development. Drawn from our experience, these principles are by no means exhaustive - they simply reflect what has worked for us and what has guided our decisions along the way. We offer them by way of suggestion for those embarking on similar journeys. Along these same lines, we conclude the article by suggesting implications of our work for widespread change.

What we do and why - Six guiding principles

• Focus on learning and learners

Project LEA/RN embraces an active view of learning. This perspective grounded in two decades of research in cognitive psychology has changed what we know about learning and learners. This perspective emphasizes the active participation of the learner in the process of understanding the world and stands in stark contrast to traditional views.

This active view of learning radically changes what faculty must do to enable learning. From this perspective instruction should be the process of guiding and supporting the knowledge construction of students.

According to this model, learners act on information to make it meaningful by creating connections, discovering relationships, formulating and reformulating patterns. Consequently, students need to be actively engaged, not in the memorization of facts, but in representing their ideas, giving explanations, challenging and defending solutions, and exploring further implications. To enable students to take these effective actions, faculty now must design tasks, model problem-solving actions, provide feedback on performance, challenge prior beliefs, and manage and focus discussion as needed. Because learning occurs best through communication and cooperation, activities are frequently structured in pairs and small groups in addition to individual activities and whole group discussion.

Authentic tasks, grounded in real-world experiences known to students enable them to build on prior knowledge and construct new knowledge. As facilitators of students' learning, faculty raise questions that push understandings to deeper levels, explore commonsense misconceptions with the goal of developing deeper insights, and help students bridge between existing knowledge and
new situations. Drawing on prior knowledge to solve real-world problems while working with others provides a natural bridge for critical self-reflection of ideas and the construction of new learning.

This new view of learning has important implications for faculty development. Two implications that have guided our efforts at Iowa State will be mentioned here. First, teaching ought to be grounded in student learning. Many improvement efforts have introduced teaching techniques or strategies paying little attention to the underlying beliefs and understandings that guide practice. Such efforts have produced little, if any, change. If long-lasting change in practice is to occur, faculty need to be given the opportunity to examine what they do and why they do it, and they need to examine the learning process itself. With a better understanding of learning and learners, faculty will be better able to design instruction to enhance student learning.

Second, faculty development ought to be consistent with the ways in which faculty learn. And, as it turns out, faculty learn in ways similar to students. Just as course content cannot simply be "given" to students through lecture, so too, new insights into pedagogy cannot simply be "given" to faculty in "sit-and-get" workshops. Faculty, like students, learn by reading, experiencing, reflecting, and collaborating with others. If change in practice is to become a reality, then faculty need to be given the opportunity to examine underlying beliefs, experiment with new strategies, bounce ideas off of colleagues, and consequently, fashion new understandings of learners, content, and pedagogy. These ideas about learners and learning lie at the heart of Project LEA/RN and weave throughout the principles offered here.

- **Address faculty concerns**

We believe that faculty already know a lot about teaching. Therefore, we see the role of Project LEA/RN as one of tapping this knowledge and helping faculty to learn what they want to learn.

Consistent with this philosophy, the content of Project LEA/RN stems from and is connected to faculty concerns. No curriculum existed for the original TAG group. The intent was to use the interest and needs of the engineering faculty to guide the direction of the group. Early discussions took the form of four thrusts: engagement strategies, questioning strategies, lesson planning, and assessment. Today, these four thrusts continue to serve as points of departure for faculty inquiry, experimentation, and discussion.

Early sessions introduce participants to active learning strategies. While there are many reasons that prompt faculty to join LEA/RN groups, an often stated reason is the desire to find ways to engage students more actively with course content and issues related to a topic. To this end, initial discussions among faculty explore various ways that instructors can structure learning experiences for students that promote more student involvement (e.g. activities that provide students opportunities to reason, defend, explain, etc.). Instructors are introduced initially to informal strategies such as Turn to Your Partner (TTYP), Problem Solving Pairs, and gradually examine more formal cooperative learning strategies. Faculty also study effective group functioning.
As professors work to incorporate these strategies into their courses, they discover that the extent of student involvement with each other and with the content is often a function of the "quality" of the question asked, or the nature of the activity assigned, by the instructor. This realization leads naturally to the second thrust -- questioning strategies. Through a number of activities, faculty examine the relationship between the types of questions they ask and the type of learning required of students. Faculty work on developing questions and designing tasks that engage students in activities that promote higher level thinking, problem-solving, and collaborative inquiry.

The first two thrusts lay the foundation for the next two thrusts: lesson planning and assessment. As faculty work to engage students with content and to improve the quality of the questions they ask, the issue of identifying desired student outcomes and planning lessons to achieve these outcomes naturally comes to the forefront of faculty discussion. With this new awareness, faculty work, both individually and in groups, to develop objectives, write lessons, and design activities that promote these outcomes. Finally, faculty are introduced to alternative classroom assessment techniques such as the One Minute Paper and the Muddiest Point to help them assess student learning and the effectiveness of instruction.

Through faculty-driven inquiry into these four thrusts, examined in the context of their own classroom practice, we are able to create "the rub between theory and practice." It is our impression that this "rub" is crucial to faculty gaining new understandings of learning and learners and consequently, to changing practice.

• Agitate and educate

Workshops are a natural part of faculty life. Faculty are well acquainted with lectures, demonstrations, powerpoint presentations, etc. Much to the discomfort of some faculty, such standard fare is not the stuff and substance of Project LEA/RN. From the first day, faculty are literally up and out of their chairs, participating in hands-on activities.

Activities are chosen to prompt faculty to take a good hard look at their classroom practices, challenging them to think about what they do and why, and allow them to forge new understandings about learning. Activities are followed by "processing time" - large group discussion led by facilitators where participants process not only the content of the activity but also the nature of the activity itself.

This process of prompting reflection often takes the form of what is now a hallmark of Project LEA/RN, the "go-round". In the go-round the facilitator poses a question and, as the name suggests, then goes round the room soliciting responses from participants. Questions typically focus on the structure of the activity, participants’ experience of learning, and implications of the activity for the classroom.

The go-round has several advantages. First, it provides facilitators with a quick check of where faculty are at. Second, it allows faculty to bounce ideas around, see issues from multiple perspectives, and support one another. And finally, it gives faculty yet another opportunity to reflect on their learning.
Over the course of the semester, this process of reflection continues as participants move through the four thrusts described earlier. Activities related to the thrusts are selected by facilitators to encourage faculty to challenge beliefs, refine ideas, and build on previous topics. Midway through the first year, participants are often at the stage where they feel comfortable working as learning partners, which adds another dimension to the reflection process.

What should be apparent from this discussion is that sessions and activities are not simply demonstrations, but actual learning experiences. The combination of large group sessions in which faculty are introduced to a strategy followed by extended learning opportunities in which they experiment with strategies in their classroom is a feature that distinguishes Project LEA/RN from many traditional workshops and makes learning personal for the participants. In the words of one LEA/RN participant, “that’s when it really hits home.”

This comment reflects a key objective of Project LEA/RN. It aims to hit home, engaging faculty in the hard work and emotional upheaval that is the essence of learning. These experiences help faculty relate their experience of learning to the learning experience of their students, deepen faculty understandings, and equip them to better design instruction that fosters learning.

- **Allow sufficient time and provide support**

Prompted by internal desires and external pressures, institutions are constantly launching ambitious change projects. Such projects (frequently aimed at improving student achievement) often envision fundamental changes in the organizational structure or the manner of instruction, expecting that these envisioned changes will be quickly realized and improvements readily gained. More often than not, such efforts fail. While identifying the need for change, such visions fail to capture the complexity of change, are not based on the realities of classroom life, and ignore the support mechanisms needed to support change.

Project LEA/RN holds not only to a broader conception of faculty development but also recognizes the time and support needed by faculty to bring about change. Modeling of new strategies, coaching in the use of new techniques, and constructive feedback on practice are all important ingredients in the change process. So too is time. It takes time to develop, practice, and refine new skills. Likewise, it takes time to build community.

Simply bringing faculty together to dialogue about teaching is not sufficient. An atmosphere of trust must be present if faculty are to feel safe to examine their beliefs and to share their war stories (defeats as well as victories). While time consuming, this investment and commitment to building mutual trust and respect is critical in terms of creating a safe space for open and honest dialogue.

- **Make faculty development an ongoing experience**

A key aspect of Project LEA/RN is its view of faculty development as a continual process rather than a one-time event. As we have grown, we have developed one-day workshops and short topic sessions, the primary purpose of which has been to introduce faculty and administrators to active
learning and provide them with an overview of what we do. Yet, it is the intensive, ongoing opportunities for faculty learning that have nurtured significant changes in practice, which in turn, will ultimately reap benefits in student learning.

During the first year of participation, faculty are engaged in the hard work of critically reflecting on their practice and experimenting with new strategies. Such in-depth collaborative inquiry afford faculty the opportunity to construct new understandings about learners, learning, and content.

During their second, third, and now, as in the case of the Veteran LEA/RN group, their fourth year, faculty extend this learning. This extended learning has taken many routes. For instance, some faculty who were originally interested in informal interactive strategies have now begun to explore the possibility of building student learning communities. Others, who had a deep interest in identifying student outcomes, are now working together to align curricular objectives across classes and even across disciplines. The Veteran LEA/RN group, for the past two years, has been engaged in an in-depth study of alternative assessment.

These examples demonstrate the diversity of themes now being explored by LEA/RN faculty. While different in focus, these activities also share a common feature. None of them would have been likely to happen without an uninterrupted, extended time for faculty discussion and collaborative inquiry. They illustrate in a very real way the ongoing nature of faculty development.

- **Enlist administrative support**

  Presidents and provosts, deans and department chairs can have a powerful influence over the success of faculty development efforts by their support or lack of it. As noted by Parker Palmer, a good conversation about teaching is unlikely to happen unless leaders “expect and invite it into being”. While leaders cannot force faculty conversation to happen, they can “offer people pathways and permission to do things that they want to do, but feel unable to do for themselves”.

  Project LEA/RN has been well received on campus and is now supported by several colleges. In particular, the Dean of the College of Engineering has played a key role in the emergence of Project LEA/RN. His visible presence and enthusiastic support (both morally and financially) has been invaluable in promoting faculty learning and in "inviting conversations into being" here at Iowa State.

  **Barriers and Breakthroughs - Implications for Change**

  The journey over the past four years, far from being a straight path from here to there, has been of a winding nature, sometimes going where expected, sometimes taking unanticipated routes, with both pathways helping us to discover what worked well and what needed revamping. Nor has the journey been without obstacles and challenges.

  There has been resistance from students and from faculty. Over the years of “education as usual,” students have come to expect instructors to maintain order and to instruct students in the basic
curriculum using traditional pedagogies. Not surprisingly, then, some resent attempts to change the status quo.

Faculty, too, have concerns. Already feeling pressured by the knowledge explosion of recent years, they fear that new methods will further jeopardize their ability to “cover the material”. Pressed themselves in all directions, some faculty feel that they just can’t make the time commitment to get involved. Even for those who do get involved, the picture is not one of unmitigated success or uniform change. Participants make changes to differing degrees, and while most participants that join a LEA/RN group continue, a few drop out. Future research may help us understand these findings and shed light on ways the project could be improved to have a broader impact.

It should also be noted that the LEA/RN model is time, labor, and cost intensive. Sponsored by the College of Engineering and the University’s Center for Teaching Excellence, project participants benefit from opportunities and resources not typically provided in faculty development efforts. This is not meant to discourage those embarking on similar journeys. Rather, it is meant to challenge all of us to think realistically of the commitment needed if new visions of practice are to become a reality.

This story of obstacles and challenges, however, is incomplete. The journey has also been marked by unanticipated joys and notable successes. Over the past four years, time and time again, the guiding principles that undergird the project have been brought to life in the lived experience. Faculty do want to be effective teachers and will devote time and effort to improve the effectiveness of their teaching. They have found time when there was no time to make changes happen. They have demonstrated that given the opportunity, they will make progress in enhancing their teaching effectiveness.

There has been marked growth in participation in the project over the past four years. This growth in numbers has been accompanied by changes in the classroom. The vast majority of faculty who participate in LEA/RN have adopted to some degree new learner-centered strategies. Moreover, many have begun to examine and change the underlying assumptions about learning that guide their practice. This evidence suggests that faculty development of this nature can be effective in bringing about change.

There are undoubtedly many reasons for the success of Project LEA/RN. Two, however, stand out as central factors. First, Project LEA/RN invites faculty to consider learning as the foundation upon which to frame practice. This opportunity to pause and think deeply about learning moves teaching beyond technique. Whereas traditional development practices offer faculty tips and strategies, the opportunity to critically reflect on practice and develop their own beliefs about learners, learning, and content engages faculty in “the scholarship of teaching”.

A second and overlapping factor contributing to the impact of Project LEA/RN has been its success in building community around a common purpose. In a sense, Project LEA/RN has served as a catalyst for a collective identity. Prior to getting involved, many faculty had been searching for new ways to engage students in learning. Some had been experimenting with new methods. Others, while sensing the need for change, were at a loss for where to begin or how to
Thus, the values and aims of Project LEA/RN embodied what they were already seeking and cemented for them what they were about. It legitimated their efforts, gave them a language to articulate their aims, provided a sense of direction for their efforts, and brought them together with others who had like aspirations.

Together, individual groups of LEA/RN faculty have sought to build community around issues of teaching, breaking down the isolation so characteristic of faculty life. They have worked to build a haven wherein it is safe to take risks, explore new territory, express doubts, and do battle with one another. They serve to stretch each other’s thinking and come together collectively to solve problems. They find the courage to ask tough questions such as how can we reach students, how can we make courses more relevant, and what should we, as faculty really be doing to prepare students for the future? And, they support one another in a research culture that remains deeply ambivalent about the value of teaching. In short, these faculty have forged a collective identity to do and to dare.

**Final thoughts**

With the aim of better preparing students for the 21st century, faculty on campuses nationwide are engaged in efforts to re-engineer their curricula and instruction. Such efforts have significantly increased expectations for student achievement. Realizing these gains, however, depends in large part on re-engineering faculty development in ways that will equip faculty to bring about new learner outcomes. Seen from this perspective, faculty development is not a frill, but a necessity.

Gathered around significant issues related to student learning, empowered faculty are able to forge new knowledge and deeper understandings. Such activities serve to connect professional learning to collegial learning thus creating a collective identity among faculty. It is in this broader identity, this collective strength, wherein the hope of change lies. Working together with a shared sense of purpose, faculty can in turn empower students, helping them to shape the future of the 21st century.

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**References**


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