
Effective E-Learning for Geoscientists in the Global Multi-Generational Workplace

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ABSTRACT

This paper discusses e-learning for geoscientists in a rapidly changing world, and describes the types of web-based distance learning that can be most effective and affordable for individuals in diverse, distributed workplaces. In addition to formal learning settings, the paper discusses the aspects of informal learning that can be employed by geoscientists, and instructional design that aligns with multiple learning styles, generational characteristics, and learning goals and objectives.

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Operating under faulty assumptions will effectively divide a group and result in poor team performance. For that reason and many others, it is important to avoid stereotypes when developing a training or professional development plan, or when proposing changes in workflows.

Instead, a series of assessments and survey instruments should be administered in order to gain a clearer idea of the true picture of capabilities, attitudes, and experience with information technology and professional development.

E-LEARNING IN THE MULTI-GENERATIONAL WORKPLACE: INFORMAL AND FORMAL LEARNING FOR PROFESSIONAL DEVELOPMENT

Informal learning tends to be effective because it incorporates prior knowledge, and it is flexible enough to accommodate a variety of learning styles. For example, a geologist who wishes to learn more about 3D seismic processing may be a kinaesthetic (rather than dominantly visual or auditory) learner with substantial experience in workplace settings that require an integration of geological, geophysical, and engineering analysis. In this case, an informal learning process that builds on prior knowledge and which allows the learner to take a hands-on approach will be much more effective than a traditional lecture-based classroom learning setting.

E-learning used in workplace training and professional development is often designed to encourage the learner to build on prior knowledge, and to try a number of different pathways to get to the same result.

For example, a geologist wishing to learn more about 3D seismic may be best served by an approach that brings together the following learning elements:

- Synchronous, group learning via web conference, or webinar;
- Asynchronous self-study: reading articles, examining presentations, watching videos;
- Asynchronous self-assessment: taking online quizzes, engaging with interactive programs / graphics;
- Asynchronous team / instructor-guided assessment: creating work, then reviewing in teams or one-on-one with the instructor for focused feedback.

Avoiding a “one size fits all” approach to training is important. Although it may seem most efficient and cost effective for a company to simply purchase seats in a number of face-to-face short courses or workshops, the reality is that unless a blend of activities is used, and the individual learners are given the opportunity to work alone, with groups, and one-on-one with a mentor or instructor, the results will tend to be very poor.

The ideal educational program (training, professional development, education) combines informal and formal learning, and relies heavily on experiential learning which taps into prior knowledge. It is also highly situated, which is to say that the activities and the learning concepts tie closely to real-world activities and tasks.

SITUATED LEARNING: LEVERAGING EXPERIENTIAL LEARNING AND PRIOR KNOWLEDGE

Situated learning will help individuals apply the knowledge that they’re gaining, and to build skills and problem-solving abilities. Situated learning, which brings in a case study or a specific, tangible problem, will allow teams to form that understand the learning goals and desired outcome.

The following elements can be blended in order to achieve situated learning with both formal and informal learning approaches:

- Synchronous webinars / web conferences.
- Asynchronous problem-based e-learning: use as short courses for individual and group training.
- Building-block instructional components / learning objects: select and use to build a module or a problem-based module. Instructional components / learning objects can consist of videos, articles, audio files, software demonstrations, maps, graphics, recorded lectures, presentations.
- Synchronous project-based e-learning: use as short courses, but define the outcome clearly (a report on something, a presentation, a collection of resources and research, a portfolio).

COST-EFFECTIVENESS AND CONVENIENCE TRUMP CONVENTIONAL LEARNING APPROACHES

It may be customary for a company to require all its employees to attend face-to-face courses together in groups. Some companies even go to the expense of selecting a group to engage in training off-site in a one-week retreat, with the stated goal of avoiding distractions.

However, such training approaches are often disappointing, not just in the fact that they are expensive and may not produce uniform results; they are disappointing because actual performance does not live up to expectations.

A more cost-effective and convenient approach involves highly applied situational learning, which requires the learners to pull from all their past experiences in order to achieve a very well-defined goal. The approach used can also be adapted to cultural and corporate exigencies. They may use informal learning methods to gain the knowledge and skills to achieve their desired result, and they may take more formal online training. The precise path is something that can be developed as a team effort, between the organization and the learners.

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