

# Taking the Challenge of Evaluation in PBL

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**By capturing socio-technical interactions, a digital framework now changes the practice of project supervisors.**

*Xavier Fouger - Senior Director Global Academia Programs, Dassault Systèmes*



Collective problem solving is the essence of an engineer's professional life. Recognizing that group-level performance is central to their competitiveness, businesses are in a perpetual search of new ways to improve collaborative work. Over the last decades, digital solutions have been critical in enabling new methods of problem solving in an increasingly international and multi-disciplinary context. As a provider of such

digital infrastructure, Dassault Systemes has reached a stage where its "3DEXPERIENCE" platform –a digital infrastructure specifically centered on project optimization-, emulates a virtual workspace in which technical but also social interactions can be promoted, tracked and evaluated. It has been a natural step to extend such problem-solving framework for industry into a problem-based learning infrastructure for engineering education.

This framework, "ILICE" (Inspire/Learn/Innovate/Create/Evaluate), is a comprehensive cloud-based workspace that facilitates socio-technical collaboration among co-located or distant students working in groups. By capturing deliverables as well as interactions at all stages of a project, ILICE offers supervisors new means to monitor, guide and evaluate learning at individual and group level, addressing several of the most discussed dimensions of PBL or any other project-centric learning activity, among them, evaluation. Indeed, several key attributes of the "Evaluate" section have been specifically implemented to facilitate more authentic assessments of learning outcomes.

- **Continuous supervision.** The cloud based nature of ILICE's underlying platform is intrinsically a virtual workplace where participants in a project capture their thoughts and store numerous steps in the lifecycle of their deliverables. These events instantly update aggregated dashboards that are available to supervisors who then can intervene in the course of a group's activity, without being necessarily present. Interventions can relate to encouraging or challenging options taken by the group, investigating the causes of inactivity when remedial measures can still have positive impact, providing "wake-up calls" to individuals or to providing any type of guidance. By being continuously involved regardless of actual physical presence, supervisors build a deep understanding about the groups and individual dynamics all along the project.
- **Attributability.** When examining collective deliverables of a project, supervisors often meet difficulties in determining the actual share of each student in such results. By relying upon named-user access control and precisely allocated system rights, the ILICE framework accurately tracks the individual contributions at many levels of the computer models that describe the project's intermediate and final deliverables.
- **Peer evaluation.** Ratings of results or of work attitudes by peer students is automated by making captured interactions and project deliverables visible to anyone within a students' team or, at supervisor's discretion, across teams. Discussion-based peer evaluations are recorded and rating mechanisms, familiar to any social network user, are provided.
- **Collaborative attitude evaluation.** Employers strongly encourage spontaneous collaborative attitudes of helping each other within an industry project. To encourage such attitudes during project-centric learning activities, educators who piloted the early use of the ILICE framework, triggered students to ask "iquestions", which are made visible within or across teams. Answers provided by peers in a chat style are captured and assessed for relevance by supervisors to rate the willingness and sincerity to help and individuals are credited for those behaviors in their overall evaluation. Supervisors can also choose to rate

questions instead of answers by organizing a critical review of “questions” at the end or in the course of the project.

- **Rich defense.** A powerful evaluation tool of group work is the intermediate or final exercise by which students formally tell the story of their collective progress, the difficulties they met and the strategies or knowledge they mobilized to overcome them. Students find in the platform numerous tools to recollect the creative and human process they experienced and to graphically illustrate the milestones of their journey. Supervisors then better evaluate self-critical attitudes and can reflect upon means used by students to rationalize and share their experience.
- **Involving third parties.** Another natural use of the cloud architecture of the platform is the involvement of industry tutors by providing them with specific access profiles to the work of a student’s group. At any time they can remotely monitor and/or intervene in the workspace of the group they tutor. Not only are they so given the means to provide a more authentic context, they also build their own intimate understanding of the dynamics of the group and better substantiate their evaluation statements through recorded events.

As the use of the ILICE framework expands, Dassault Systemes now starts its application in distant, teams to better understand its contribution in an intercultural context, where students collaborate with peer whom they will never meet under the supervision of tutors living on another continent. The resulting problem solving exercise will then more completely mimic the conditions of professional life for an even more realistic learning experience.



ILICE on video

Fully customizable by educators the ILICE framework can be activated by any user of the 3DEXPERIENCE platform and is provided upon simple request at: <http://academy.3ds.com/lab/>



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