The Approach to Make Learning Visible and the Centrality

of Digital Technology

Julia Pinheiro Andrade

(Instituto Singularidades/Ativa Education, University of Sao Paulo, Brazil)

Abstract: In this paper, we present the formative journey and point out the central role of technology to mediate, differentiate, assess and evaluate change in teaching practices regarding the teacher professional development course of the Approach to Make Learning Visible (AMLV). The AMLV is a theoretical-practical progressive teacher training and development program in active methodologies, thinking routines, and documentation strategies that develop, in homology of processes, competencies, skills and attitudes already present in the group and map those which need to be developed. Its theoretical framework is based on Project Zero, the Visible Learning research by John Hattie, the Creative Learning concept by Mitchel Resnick and Paulo Bliksitein, and also on the research held at Brazilian Centro de Referências em Educação Integral (Reference Center for Integral Education).

Key words: active methodologies, teacher professional development, creative learning, teacher assessment, digital technologies

1. The Active Teacher Training

The Approach to Make Learning Visible (AMLV or ATIVA — which means Active in portuguese) is a proposal for teacher professional development born from the systematization of the teacher training extension courses offered by Instituto Singularidades, in Sao Paulo, Brazil, between 2018 and 2019. It is a formative proposal entirely based on active methodologies and digital portfolios that make learning visible and allow teachers from different educational contexts and stages to share experiences and develop collective collaborative expertise — which, according to John Hattie (2015, 2017), is the factor that impacts student's learning the most. Specifically, the course makes the discussion about self-efficacy and the development of the following competencies: creativity, communication, collaboration, (self-)assessment, feedback and metacognition-visible.

The hypothesis developed in the course is that the active methodologies (Moran, Bacich, 2018) and the stimulus towards collaboration and creativity broaden and engage the building of meaning and common language: the bases for meaningful and deep learning processes. The extensive use of digital applications in different dynamics of pedagogical differentiation (Bondie, Zushuo, 2018) potentialize and make the documentation of previous knowledge and the (re-)elaboration visible. Deep and meaningful learning stems from the visible thought collectively elaborated (Richhart, 2015; Richhart et al., 2011), which, according to the triadic theory of dispositions developed by Project Zero (Idem) simultaneously mobilizes abilities, motivation and sensitivity. Therefore, making

---

Julia Pinheiro Andrade, Master, University of Sao Paulo; research areas: teacher professional developmen, formative assessment, curriculum design, backward design. E-mail: juliaandrade@ativaedu.com.br.

thought visible and coherent with the educational objectives is a fundamental task of the teaching strategies committed to learning for integral development (Andrade, Costa, Weffort, 2019a). Assessment is proposed in its continuous formative dimension: to trigger and deepen the development of thought, perceptions and dispositions of the group as a continuous development of competencies (Idem), which promotes the assessment practice not only in or of learning but as learning.

2. Methodological Development

We develop pedagogical practices of visible learning in homology of processes (Schön, 1998) in which teachers experience, in double conception, active and meaningful learnings "through the eyes" of the students (Hattie, 2017) and plan how to transpose the studied strategies to their school reality. The course names a matrix of teaching competencies and brings to the collective consciousness a theory of change with several strategies that make visible and document the logical thread of collective and individual development: initial teaching diagnosis, visible and collective self-assessment regarding the course's themes, digital documentation in real time and final comparative self-assessment (with estimate of impact in the increasing of teaching self-efficacy).

Figure 1   Examples of Radar Chart Visible Self-Assessment Made Before and After the Studies About the Course Themes. On the Left, Analogical Model With Tags (a Yellowish or Greenish Spot Can Be Noticed After the Study) and on the Right, Digital Model With the *Mentimeter* Application (Where the Increase of Proficiency Can Be Seen by Graphic Expansion). See Examples and Detailed Explanations in Andrade (2019).

For that, digital technology plays a decisive role: through Padlets (collective digital murals) we create a collective portfolio that documents the formative process of the course in real time and makes the reflection and awareness — which deepen learning — visible. As an example, we make the Padlet of the AMLV long duration course available (2019). It can be accessed at http://bit.ly/AVL2019. The Padlet of the short duration course is also made available and can be accessed at http://bit.ly/aprendizagemvisivel1.

The Approach promotes a formative itinerary with different methodologies, all of them systematized through routines of metacognitive thought adapted from Project Zero (Richhart et al., 2011), such as See/Think/Wonder; I used to think…/Now I think…; What I knew/What I learned/What I want to know; synthesis of the flash discussion in Domino Speech, classroom syntheses through Headlines; theoretical syntheses through Conceptual Maps.
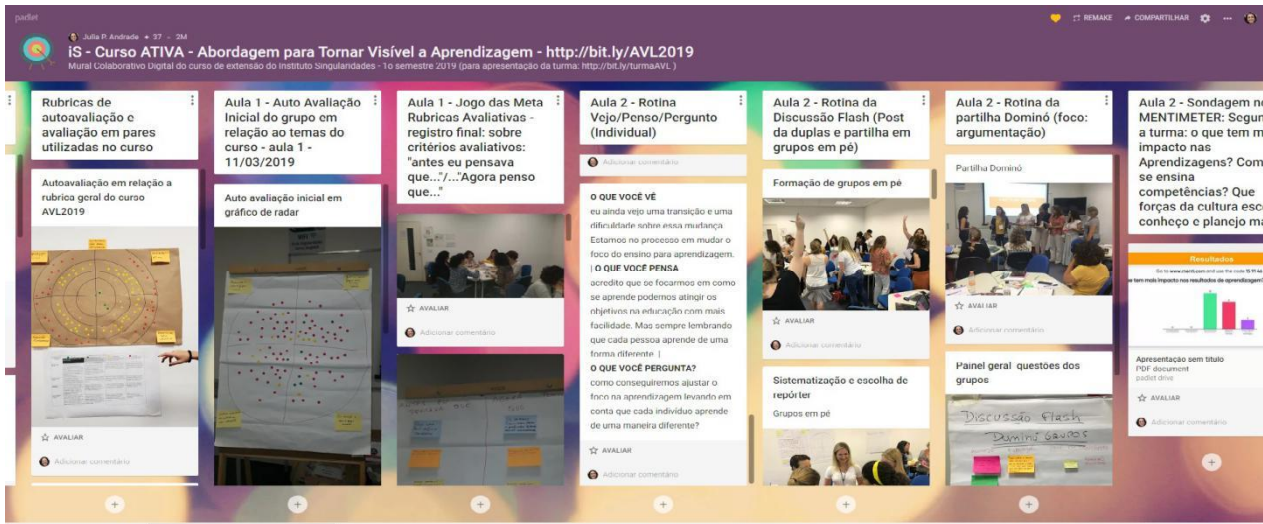
Figure 2   Illustration of a *Padlet*'s Excerpt That Registers the Online Portfolio of AMLV's Extension Course at Singularidades Institute.

Figure 3   Examples of the Use of See/Think/Wonder or Imagine Thinking Routine at the AMLV Course. The Activity Was Planned During the Course and Applied With Seven-Year-Old Students. By Seeing an Image, Students Reflect About and Register, in a Paused Manner: "What Do We See?" and Afterwords; "What Do We Think About What We See?" and, Then, "What Do We Imagine About What We See? Which Questions Do We Have?" On the Right, the Student Is the Scribe for His Group During An Image Reading Activity. On the Right, Mural With the Records of Several Routines About Several Different Images.

The Thinking Routines we use the most are:

• See/Think/Wonder: about an image (photo, map, scene, object) — description of what is seen, what is thought about what is seen, and what is imagined or asked from what is seen and thought. See examples on Figure 3;

• Zoom: the same as the previous one, but focused on image reading. Firstly, showing a detail of the image and reading it according to the three steps (what I see, what I think, what I wonder). Afterwards, the whole image is revealed and the See/Think/Wonder interpretation is repeated. Finally, what has changed about thoughts is compared between the observation of a part of the image and the whole scene.

• I used to think.../Now I Think…: routine in order to assess the developed learning in a learning process. It may become more reflective and projective by adding "Do I still wonder if…?" in order to unfold more reflections about the study.

• What I knew/What I learned/What I want to know or Think/Puzzle/Explore: routine of documenting and analytical assessing about the learning process itself. A more personal version may be used with: "I think I know/Today I learned/I want to explore more…";

• Think/Pair/Share: routine we use with "flash discussion" (Andrade, Costa, Weffort, 2019b): about a question — firstly it is individually thought out and documented. Afterwards, it is done in pairs, then in groups of four standing up in the classroom. Each group elects a reporter to expose the synthesis to the classroom.

• Domino Speech: the groups prepare a reporter to go up front in the classroom to summarize their discussion. Side by side, all reporters speak, one after the other, connecting ideas and avoiding redundancies (Idem);

• Headlines: production of a synthesis of a class or reading through the elaboration of a newspaper headline (the journalistic styles may vary in this report, from the more sensationalist to the more factual and objective approach);

• Generate/Sort/Connect/Elaborate: promotion of the documentation of central ideas (previous ideas and research through reading) as Conceptual Maps.

The Padlet directly records some of these routines as it is also the platform to publish other technologies widely used: interactive digital reflection with several kinds of graphics and texts from Mentimeter; videos and digital narratives posted on Youtube or condensed on Flipgrid (Cf. the aforementioned links). The formative journey aims at the triadic proposal (abilities, dispositions and sensitivities) of competencies development (Richhart et al., 2011) through the following methodologies:

1) Self-assessment of initial and final teaching efficacy (Google Forms) inspired by TALIS questionnaire (OCDE, 2013);

2) Visible collective self-assessment (Andrade, 2019) through graphics and collaborative rubrics of the course concepts: a) through radar graphics in analogical version with tags; b) in interactive digital online version with tags; c) in an interactive digital online version (Mentimeter); c) with proficiency rubrics, comparing the progression of learning; d) applied to the OECD creativity rubrics (Lucas et al., 2013);

3) Brazilian version of the assessment game Metarubrics from the Teaching System Lab do Massachusetts Institute of Technology (Andrade, Saravalle, 2019) — gamification that elaborates and highlights the need to make the definition of assessment criteria visible to the students;

4) Comparison and experience of pedagogical practices in double conception, for example, regarding the learning of electric circuits, we place teachers in a real situation of visible learning homologous to the experience of the students: a) initial self-assessment with rubrics; b) learning based on problems (Problem-Based Learning) through structured challenges with electric circuits on paper; c) Open Creative Learning with electric circuits (items 5 and 6); d) in comparison between methodologies;

5) Open creative projects (Project-Based Learning) triggered by microworlds (Papert, 2007) according to the creative learning proposal by Resnick (2018) and to the meaningful hands-on making (Blikstein et al., 2016) in

two methodologies: a) collective co-creation of the school we want; b) Circles of Inventions (Ricci et al., 2019), project with maker kit triggered through literary narratives and mediated by thinking routines;

6) Process of Design Thinking in heterogenous groups about the eight forces through which we can transform and model school culture (Richhart, 2015): research, empathy map, ideation, prototyping, communication and feedback by pairs to model an educational innovation project condensing the concepts, methodologies and tools studied in the course.

3. Results and Reflections

As an Action Research in progress, AMLV connects, in its own specific way, different theories and methodologies through digital technology. All of them converge in the promotion of experiences that make learning visible, concrete and intentionally differentiated (Bondie & Zushuo, 2018), bringing evidence to the debate. The analytical-pedagogical focus is recognized and named by the group in a clear intentionality: developing and assessing one's own learning of competencies through each methodology, comparing and recognizing them in their professional practices, asserting potentialities and limits. The strategies of visible self-assessment, mostly with rubrics, facilitate metacognition and theoretical proficiency in methodology analysis and management, as much as they broaden its engagement. Teaching self-efficacy is materialized when understood and theorized, when teachers are able to name and give feedback about the visibility of competencies proficiency developed in group. According to the Project Zero founding research, to name and to perceive one's own thought and when it occurs is the condition to control and modulate it. Consciousness about the different occasions and modes of thinking is key: "This awareness of occasions for thinking is the foundation of all dispositions" (Richhart et al., 2011, p. 29). As indicated by Lucas, Claxton and Spencer (2013), the emphasis on self-knowledge and in the metacognition of learnings — and we, from the teaching self-efficacy, hypothesize — is the key to consolidate the effective development of competencies, far beyond content.

References

Andrade J. P. (2019). "Autoavaliação na aprendizagem criativa: como tornar visível os objetivos de aprendizagem?", in: Catálogo do Festival de Invenção e Criatividade, *São Paulo: Rede Brasileira de Aprendizagem Criativa*, accessed on 9th May, 2019, available online at: https://juliapinheiroandrade.wordpress.com/2020/05/02/auto-avaliacao-visivel-digital/.

Andrade J. P., Costa N. and Weffort H. F. (2019a). "Currículo e Educação Integral na Prática: uma referência para estados e municípios", Caderno 1 e 2, in: *Currículo na Educação Integral*, São Paulo: Centro de Referências em Educação Integral/British Council, accessed on November 9th 2019, available online at: http://educacaointegral.org.br/curriculo-na-educacao-integral.

Andrade J. P., Costa N. and Weffort H. F. (2019b). "Metodologia da discussão Rápida ou flash", in: *Currículo na Educação Integral*, São Paulo: Centro de Referências em Educação Integral/British Council, accessed on 9th Nov., 2019, available online at: https://educacaointegral.org.br/curriculo-na-educacao-integral/materiais/etapa-4-metodologia-discussao-flash.

Andrade J. P. and Savaralle C. (2019). "Jogo das Meta Rubricas Avaliativas – Tradução ao português", in: *Centro de Referências em Educação Integral*, accessed on 30th July, 2019, available online at: https://educacaointegral.org.br/metodologias/jogo-das-metarubricas-como-avaliar-de-forma-ludica.

Bacich L. and Moran J. (Orgs.) (2018). *Metodologias Ativas para uma educação inovadora: uma abordagem teórico-prática*, São Paulo: Grupo A/Penso.

Blikstein P., Martinez S. L. and Pang H. (Eds.) (2016). *Meaningful Making: Projects and Inspirations for Fab Labs+ Makerspaces*, Constructing Modern Knowledge Press.

Bondie R. and Zusho A. (2018). *Differentiated Instruction Made Practical: Engaging the Extremes Through Classroom Routines*, Routledge.

Hattie J. (2017). *Aprendizagem visível para professores*, São Paulo: Penso.

Hattie J. (2015). *What Works Best in Education: The Politics of Collaborative Expertise — Always Learning*, Pearson.

Lucas B., Claxton G. and Spencer E. (2013). "Progression in student creativity in school: First steps towards new forms of formative assessments", OECD, accessed on July 10th 2019, available online at: http://repositorio.minedu.gob.pe/handle/123456789/2493.

OECD (Organização para Cooperação e Desenvolvimento Econômico) (2015). Pesquisa Internacional sobre Ensino e Aprendizagem (TALIS) 2013, Questionário do Professor Ensino Fundamental 6° ao 9° ano ou 5ª a 8ª série, Brasília, INEP.

Papert S. and Papert S. (1993). *Mindstorms: Children, Computers and Powerful Ideas*, Basic Books, NY.

Resnick M. (2017). *Lifelong Kindergarten: Cultivating Creativity Through Projects, Passion, Peers, and Play*, MIT Press.

Ritchhart R. (2015). *Creating Cultures of Thinking: The 8 Forces We Must Master to Truly Transform Our Schools*, John Wiley & Sons.

Ritchhart R., Church M. and Morrison K. (2011). *Making Thinking Visible: How to Promote Engagement, Understanding, and Independence for All Learners*, San Francisco: Jossay-Bass.

Ricci P., Ledermann S. and Camargo R. (2019). "Circles of invention", in: *Fablearn Conference*, New York, accessed on July 10th 2019, available online at: https://nyc2019.fablearn.org/wp-content/uploads/2019/04/FL2019_paper_113.pdf.

Shön D. (1998). *El profesional reflexivo. Cómo piensan los profesionales cuando actúan*, Buenos Aires: Paidos.

Wiggins G. and Mctighe J. (2005). *Understanding by Design*, Ascd.