Teaching for Functional Competency:
The Case for a Transdisciplinary Approach

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Introduction

The study evaluates the use of a transdisciplinary (TD) model for developing functional competency in French. The environment has been selected as the curricular content because it is known to be relevant and of importance in the lives of learners, particularly adolescents and younger adults. The deterioration of the global environment directly impacts all our lives and particularly, in the future, the lives of our students. Learners have consistently expressed themselves in our class surveys in favor of learning about the environment. Our hypothesis is that, as learners attempt to share complex knowledge and ideas which are of immediate importance to them, they are challenged to use new strategies made available by the instructor to express themselves. Thus they become more proficient, or functionally competent, in the target language. The ACTFL proficiency guidelines – speaking (1999) provide the linguistic methodology by means of which we define and benchmark functional proficiency. The study is limited to speaking. Functional competency is the learner's ability to accomplish linguistic tasks representing levels defined by the ACTFL proficiency guidelines. While these are designed as a metric for evaluation, they are also a useful resource for improving proficiency. In order to spiral the learner up (ACTFL OPI glossary) to a more advanced level of functional competency, the instructor uses scaffolding. Wood, Bruner and Ross (1976) may have been first to use the term.

More recently, Lipscomb compared scaffolding in instruction to scaffolding in construction – that is, the creation of a temporary support system:

> The term "scaffolding" was developed as a metaphor to describe the type of assistance offered by a teacher or peer to support learning. In the process of scaffolding, the teacher helps the student master a task or concept that the student is initially unable to grasp independently. The teacher offers assistance with only those skills that are beyond the student's capability. Of great importance is allowing the student to complete as much of the task as possible, unassisted. The teacher only attempts to help the student with tasks that are just beyond his current capability. Student errors are expected, but, with teacher feedback and prompting, the student is able to achieve the task or goal. When the student takes responsibility for or masters the task, the teacher begins the process of "fading", or the gradual removal of the scaffolding, which allows the student to work independently.
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> The ultimate goal of instruction is independent learning which is under the complete control of the student" (Lipscomb et al., 2004).

Scaffolding enables the learner:

- To proceed from the familiar to the unfamiliar
- To transition from the personal to the public
- To deepen understanding
- To express complex ideas that are especially relevant to him or her

- To benefit from peer teaching and learning
- To grow as a Subject

The functions selected to demonstrate a development in competency using scaffolded instruction are: the tasks the speaker can accomplish; the context and content; the accuracy; and the text type.

Context: learners and tasks

The context is a high school classroom conducted exclusively in the target language. Learners are Intermediate Level French students. For most, this is the fifth year of language study. The unit is taught in the last trimester in the academic year, by which time many of the students are functioning in the Intermediate High (IH) range. The linguistic purpose is to propel the students to Advanced level as defined by ACTFL, providing them with opportunities to practice specific Advanced Level tasks. These are:

- Dealing with a subject of general or public interest (Task)
- Dealing with a complication (Function)
- Accuracy (tailoring of language)(detailed and precise concrete description and narration)
- Using extended discourse (Text Type)
- Narration in different time frames (Function)

In addition, some students who are ready practice two scaffolded Superior tasks.

- Opinion supported by structured argument (Function)
- Hypothesis, also supported by structured argument (Function)

Table 1: ACTFL Proficiency Guidelines—Speaking (Revised 1999)

Superior	Advanced	Intermediate	Novice
Superior-level speakers are characterized by the ability to:	Advanced-level speakers are characterized by the ability to:	Intermediate-level speakers are characterized by the ability to:	Novice-level speakers are characterized by the ability to:
• participate fully and effectively in conversations in formal and informal settings on topics related to practical needs and areas of professional and/or scholarly interests	• participate actively in conversations in most informal and some formal settings on topics of personal and public interest	• participate in simple, direct conversations on generally predictable topics related to daily activities and personal environment	• respond to simple questions on the most common features of daily life
• provide a structured argument to explain and defend opinions and develop effective hypotheses within extended discourse	• narrate and describe in major time frames with good control of aspect	• create with the languages and communicate personal meaning to sympathetic interlocutors by combining language elements in discrete sentences and strings of sentences	• convey minimal meaning to interlocutors experienced with dealing with foreigners by using isolated words, lists of words, memorized phrases and some personalized recombinations of words and phrases
• discuss topics concretely and abstractly	• deal effectively with unanticipated complications through a variety of communicative devices	• obtain and give information by asking and answering questions	• satisfy a very limited number of immediate needs
• deal with a linguistically unfamiliar situation	• sustain communication by using, with suitable accuracy and confidence, connected discourse of paragraph length and substance	• sustain and bring to a close a number of basic, uncomplicated communicative exchanges, often in a reactive mode	
• maintain a high degree of linguistic accuracy	• satisfy the demands of work and/or school situations	• satisfy simple personal needs and social demands to survive in the target language culture	
• satisfy the linguistic demands of professional and/or scholarly life			

For learners with an IH level floor, these tasks are considered ceilings. The Assessment Rubric is designed recognizing that the purpose of accomplishing these Advanced level tasks for an Intermediate student is practice, not mastery over a range of topics.

Content: Description of the environment curriculum

The environment project is an inquiry-based trimester project which focuses on problems of the environment and their solutions. Global warming, its causes, existing solutions and hypothetical or potential solutions are considered in the context of the need to remain sustainable. The lynch pin is the over-dependency of consumer societies on fossil-based fuels (oil and gas) which may be used up in their present extractable forms by 2050. The consumption of fossil fuels for transport, plastics and other uses causes pollution, green house gases, the depletion of the ozone layer, the melting of polar ice caps and glaciers, and other unnatural phenomenal, are problems which are the well-documented problems (for example, McKibben), for which mankind must find solutions.

LinguaFolio is used as a pre-test; therefore, each learner assumes ownership of his or her level of functional competency from the introduction of the environment project. Targeted language skills are scaffolded by means of instructor-designed practice exercises, skits, etc….) and evaluated with formative assessments. The subject content is also modeled: a new module is researched and discussed each week for six weeks. Among topics that have been modeled are acid rain, pollution, regulatory history, loss of biodiversity, and alternative energies (among them solar, geothermal, nuclear, fusion, waste incineration as a fuel source, hydroelectric power generation, various alternative solutions for automotive transportation). New topics are added as the environmental situation changes, or as requested by learners.

Following the preparatory work, and after having familiarized themselves with the Assessment Rubric, working in instructor-selected heterogeneous groups, students choose an environmental issue, and discuss the process by means of which they will present the problem and its solutions, both existing and hypothetical. The topic may have been modeled, or may be a subject of their own choosing. In 2009-2010, for example, one group selected a problem which had not been modeled—overpopulation—which they related to global warming. The groups research the problem and existing solutions, and try to adduce new and original solutions. Jig-sawing and other strategies deepen understanding and provide an opportunity for further functional practice. The rubric-based assessment is a presentation with materials the group has created to (Powerpoint, physical model, poster or other) to demonstrate the topic, followed by questioning by all learners and instructor. Another option would be for a student-selected panel of peers using the rubric to evaluate the presentation, with instructor oversight of the final rating. The rubric focuses the assessment on elements of functional competency: the rubric could also focus on different desired outcomes (persuasiveness, quality of the group work, etc.).

Figure 2. Assessment Rubric

Criteria	Exceptional 5	Very Good 4	Good 3-2	Needs more work 1-0	GROUP SCORE (group members all have same score)
Present a topic of general or public interest	The topic is of general or public interest	The topic is of some general or public interest; limited personal material is also introduced	The topic is of some general interest; there is also anecdotal and personal material	The topic is anecdotal and of personal interest without enough general interest	
Narrate in different time frames	Learners narrate in past, present and future with good control of aspect	Learners narrate in two of the three time frames with good control of aspect	Learners narrate in the present with good control of aspect	Learners do not yet narrate in present with good control of aspect	
Use strategies to deal with a complication	Learners use strategies to deal successfully with a complication	Learners attempt to deal with a complication; in all but one or two utterances, they do so successfully	Learners attempt to deal with a complication but lack appropriate syntax or structures	Learners do not attempt to deal with a complication, or show patterns of breakdown	
Use extended discourse	Learners use paragraph length discourse, with effective use of cohesive devices	Learners use connected discourse and there are some cohesive devices.	Learners use strings of sentences; there are not yet any cohesive devices	Learners use sentence-length utterances. There are no cohesive devices yet.	
Speak with accuracy	All learners sustain communication with accuracy and confidence	All but one sustain communication with accuracy and confidence	All but two sustain communication with accuracy and confidence	The group in general shows patterns of linguistic or other breakdown	
Group score: /20					
Bonus points /5 ↓					
Support hypothesis or opinion with structured argument	One or more learners support(s) hypothesis with structured argument	One or more support opinion with structured argument	One or more give an opinion, unsupported by argument	No one in the groups offers opinion or hypothesis	

The transdisciplinary approach

This study shows that learners make use of newly acquired strategies to express complex ideas that are especially relevant to themselves. The environment in the twenty-first century provides fertile content for learners to grapple with complex and challenging ideas which are important to them. They know that previous generations have aggravated these problems, and have not resolved them. However, since ideas about the environment can no longer be limited or narrowly focused, a shift to a wider and more flexible approach is required than a standard, narrowly focused language class. An environmental issue such as global warming encompasses a myriad disciplines – politics, earth sciences, oceanography, meteorology, environmental and biological sciences, economics, sociology, culture and language, demographics, glaciology, anthropology, others. The transdisciplinary approach allows for a focus on the problem itself, with the possibility of new perspectives opening up as the problem evolves in time.

The term transdisciplinary was first used by Piaget in the 1970s, although neither France nor the OECD, at whose meeting the term was used, were ready for the concept in that year (Nicolescu, Transdisciplinarity 1). The Holistic Education Network defines different approaches that have evolved as a result of the insufficiency of research in a disciplinary framework:

- the multidisciplinary model - which uses the knowledge and understanding of more than one discipline to understand reality (for example, biology and architecture) -
- the interdisciplinary model - which uses the epistemologies or methods of one discipline within another (biochemistry, astrophysics),
- the transdisciplinary model – which focuses on an issue such as pollution or hunger both within and beyond disciplinary boundaries, with the possibility for new perspectives.

Some of the ideas of transdisciplinarity are by no means new. Dewey wrote of the importance of meaning in understanding (Dewey, 116 ff), which is central to the transdisciplinary approach (Nicolescu, Transdisciplinary Evolution of learning, 7). In the 1990's there was an increasing interest in crossing disciplines (Grady, 1994; Adler and Flihan, 1997). The concept of transdisciplinarity is defined in the Charter of Transdisciplinarity (La Charte de la Transdisciplinarité) which was agreed at a meeting in Portugal, Convento da Arrábida, November 6, 1994. Work in the field of transdisciplinarity has become increasingly important in the last two decades. The *Centre International de Recherche et Etudes Transdisciplinaires* (CIRET) (Center for International Research and Transdisciplinary Studies) is a prolific publisher under the leadership of Basarab Nicolescu. In the US there are many transdisciplinary journals only two of which are the *International Journal of Transdisciplinary Research* – (on economic issues); and the *Transdisciplinary Journal of Engineering and Science*.

It is necessary to grasp a few basic concepts of transdisciplinarity in order to understand how they benefit the study of language in our French classes.

Beyond disciplines

A disciplinary study, which can complement the transdisciplinary approach, goes beyond disciplines. As the prefix "trans" indicates, trans-disciplinary concerns that which is at once between the disciplines, across the different disciplines, and beyond all discipline. Its goal is the understanding of the present world, of which one of the imperatives is the unity of knowledge. (Nicolescu, Transdisciplinary Evolution, 2). Its goal of study is the subject itself, not the discipline with which the subject may traditionally have been associated.

Open and unlimited

The problems of the environment are global in scope. The transdisciplinary approach is not limited by national or other boundaries. A transdisciplinary framework is "globally open" (Nicolescu, 3). Knowledge itself is open. Transdisciplinarity is by definition trans-political, trans-national, and trans-cultural (Nicolescu, 5). For example, it is not really possible to think about pollution – a global phenomenon – in a single country or region, without thinking of multiple countries, and without thinking also of the international politics amongst those countries. Air pollution flows with wind and knows no national boundaries. In a transdisciplinary study, the subject of inquiry becomes pollution itself, without limitation for national boundaries or other limitations or restrictions.

Revaluation of intuition, imagination and emotion in the context of scientific inquiry

Transdisciplinary education values rationality and the scientific approach; on the other hand, it also "revalues the role of intuition, imagination, sensibility and the body in the transmission of knowledge". (Charter, Article 11, 3).   Rigor, openness, and tolerance are fundamental characteristics of the transdisciplinary attitude and vision. Rigor in argument, taking into account all existing data, is the best defense against possible distortions. Openness involves an acceptance of the unknown, the unexpected and the unforeseeable. Affective learning, learning with the emotions, is recognized as a powerful form of learning (Nicolescu, *Transdisciplinary evolution of learning*, 6). It values sharing and mediation amongst people. Tolerance implies acknowledging the right to ideas and truths opposed to our own (Charter, Article 14).

Actualization of interior potentialities of the individual

The report to UNESCO of the International Commission on Education in the Twenty-first Century, chaired by Jacques Delors, in emphasizing four pillars of a new kind of education ("learning to know, learning to do, learning to live together, and learning to be") believes under the second rubric in the connectedness or interdependency of people "who are able to adapt themselves to the changing exigencies of professional life, and who are endowed with a permanent flexibility, which is always oriented towards the actualization of their interior potentialities" (In Nicolescu, *Transdisciplinary Evolution of Learning*, 4).   The transdisciplinary approach in the language class therefore makes it possible for the learner to improve his or her proficiency in the target language, but also to grow as Subject.

How is the transdisciplinary approach useful in spiraling the learner from Intermediate to Advanced level functions?

Many language teachers are aware that they can "teach" what students need to know, but the difficulty is getting students to apply what they have been taught. Even more difficult is to achieve mastery of taught linguistic skills and concepts. In the following pages, we will focus on functions, or skills targeted to spiral Intermediate level learners to advanced level tasks.

Dealing with a subject of general or public interest

A benefit of the TD framework when used with the environmental curriculum is that, with effective scaffolding, the learner can be spiraled from topics of limited and personal interest which are a hallmark of Intermediate speakers (personal interests and activities, friends and family), to topics of general and public interest. Posing questions that gradually lead students from easy or familiar examples to more complex ideas has also been described by Rosenshine (Rosenshine, 1979, 1983). The strategy of scaffolding or guiding instruction, by systematically sequencing tasks to move from the personal to the public is effective for teaching thinking skills as well as content. Certain topics lend themselves to starting with the personal and moving to the public. For example pollution, can be presented initially in personal terms (health effects on self; solutions include personal considerations like walking to school or work instead of driving). Learners, however, know about the issues of pollution in a broader context (the city, the state, the country, globally), as well the impact on populations, on public health, etc…. The instructor

easily scaffolds instruction, so that the learner is spiraled up from a topic of personal and private interest to a topic of general and public interest. This provides practice in an Advanced level function.

Dealing with a complication

Similarly, the environment project in the TD framework provides a natural format in which the learner is presented with a complication. In communication, a complication is a difficulty or problem which requires the speaker to use unanticipated syntax, circumlocution, paraphrasing, and generally more refined linguistic skills. A content problem has a similar effect. In the environment curriculum, the resolution of a problem in a way which is favorable with respect to the environment frequently causes another problem, which functions as the linguistic complication. Frequently it is economic or financial in nature. For example, a group of our students presented on the destruction of the Amazon rainforest: their research showed that while preventing the destruction of rainforest trees is imperative to prevent accelerating global warming, it is also necessary to provide for the economic survival of the people who depend on harvesting the Amazon's huge timbers (the complication). The solution they adduced was ecotourism – not a novel idea, but one which called for description with tailored syntax; their conclusion related to scientific reasoning about greenhouse gases as well as culturally-based vocabulary and narration in future time, to express ideas about future economic sustainability. Learners who deal with a complication are practicing an Advanced level function. This example involving multiple problems in different domains requires a deepening of knowledge which is associated with spiraling to the next level of understanding, mediation, intuitive thinking and imagination, all associated with the transdisciplinary approach.

Accuracy

We have found that the need to express ideas on topics that are relevant and that they deem of importance motivates learners to deepen their understanding and to use specialized vocabularies which channel meaning. For example, when a student researching river pollution describes with concrete examples and in vivid detail pollution as it once was on the Hudson River, including details of the flotsam and toxic waste disgorged into the water, its color which ranges from brown to deep purple, she is accomplishing a task which requires specialized and tailored concrete vocabulary. The tailoring of language - selecting language for a specific purpose such as to convince, to persuade, or to incite to action – has been used by our students who are passionate about a subject. For example, under the rubric of the protection of animals and endangered animals, learners have used tailored language to describe the plight of gorillas and to ask for student support to help protect them. Such tailoring of language, the use of which may be related to the sense of outrage the students feel, is an Advanced Level task, and is more profound than typical discourse at Intermediate.

Using extended discourse

Learners need to describe in detail to convey meaning. Elaboration means adding more detail and specificity in the exposition of a particular idea. For example, the story of the gradual disappearance of the northern and southern right whales cannot be told in one or two sentences.

Descriptions for such topics will require longer than sentence-length utterances. The instructor's scaffolding in this regard consists in providing practice in the use of cohesive devices which will spiral the learner's utterances from strings of sentences to paragraph length discourse.   Examples of cohesive devices which might be useful are relative pronouns, pronouns substitutions (such as subject and object), and conjunctions.   It is the use of cohesive devices linking ideas that will allow them to flow seamlessly within sentences to form paragraph-length extended discourse

Narration in different time frames

The environment lends itself to working with narration in the past – the history of the problem the learners have selected, and the future – the prognosis for recovery, or alternatively, for complete catastrophe. Our students have been fascinated by alternative technologies, and many have selected alternative fuels and alternative cars. The gamut of topics ranges from the invention and story of the electric car, including its disappearance from the market place (the facts are detailed in the film *Who Killed the Electric Car*) to the future of the solar powered car. Scaffolding consists of continuing practice so that students are able to control aspect in description and narration in past, present, and future time.

Opinion or hypothesis with structured argument

Occasionally, in an appropriate context with IH students, it is possible for the instructor or peer to elicit supporting argument. Argument is intended to persuade or convince, and requires the speaker to think in specific ways to organize his or her ideas. For example, if a learner gives a favorable opinion of nuclear energy, s/he might be asked why. (Arguments for are: nuclear power generation provides clean energy; insignificant pollution; requires a small quantity of fuel; yields high wattage for the cost). If on the other hand, the learner is unfavorable, elicitation might lead to discourse on negative risks (difficulty of waste disposal; environmental concerns; heavy water, the warming of bodies of water, loss of animal life with construction of power plans). An ensuing discussion might lead to the elicitation of hypothesis with structured argument (for example, which method of waste disposal is preferable - vitrification (used in France) or burial of nuclear waste (used in the US)? Students with strong feelings can be challenged, and can in some cases support their opinion or hypothesis with a structured argument.

Fluency

The ultimate objective as the instructor "systematically sequences prompted content, materials tasks, and teacher and peer support to optimize learning" (Dickson, Chard, & Simmons, 1993, in Larkin, 2002) as s/he spirals the learner to the next level of functional competency is to maximize the learner's fluency – that is, how the listener perceives the reader. Fluency is a function of the clarity of expression, the ordering of ideas, and the use of syntax and morphological structures. In the transdisciplinary study of the environment, where students worked both in groups and with partners, depending on the phase of the project, learning was maximized by peer teaching – that is, a student who has already mastered a concept or skill helps a peer. The peer teaching strategy is associated with scaffolding, as discussed above.

Summary: The case for the transdisciplinary approach

We believe that in the twenty-first century, a disciplinary paradigm alone is insufficient for teaching language in a global world; it also seems to be insufficient for teaching a curriculum that is relevant to Intermediate level learners or higher, since important issues students might be discussing cannot be limited by narrow strictures such as disciplinary or national boundaries. This is true for students of French, since the language is spoken by over two hundred million French and Francophones speakers and second language speakers, each with their own linguistic variants and specific cultures. The use of other disciplinary models alone was not deemed helpful for our language classes, for the reason that disciplinary, interdisciplinary and multi-disciplinary approaches are limited or restrictive when used alone, and may not challenge learners to pursue their inquiry in the same way as the transdisciplinary approach.

With respect to the transdisciplinary model, the one negative that can be adduced is that it is extremely challenging for all players, including the instructor. The latter is constantly searching for new information that will feed into the environment project, new strategies for learners. They in turn also struggle to absorb new content knowledge, think intuitively and imaginatively about possible solutions, and are challenged to express facts and thoughts in the target language. Certain teaching strategies can help.

The instructor's pedagogical methodology is critical to the task. Work must be in the target language work without exception. The instructor is the facilitator. Group work allows learners to take risks and learn from peers. They are supported in group or class presentations, learn social and leadership skills, and other skills such as mediation and power-sharing. Learners are given assistance, but as they begin to demonstrate mastery, the assistance is decreased in order to shift the responsibility for learning from the instructor to the learners (Larkin, 2002). All elements of functional competency targeted by the instructor are practiced in a variety of ways; learners are empowered (given choice, invited to help in planning and decision making, participate in peer evaluation). All assessments are rubric-based, thereby focusing the attention of learners on goals which are theirs as well as the instructor's. The rubric also provides a rationale for the eventual grade; from it, learners will be able to deduce what to do next to improve. Finally, class dynamics are important: they include an emphasis on rigor but also on tolerance; a positive atmosphere that encourages risk taking; no focus on errors; and students supporting each other. Concluding surveys have shown that despite, or perhaps because of the challenges, learners recognize the benefits of the environment curriculum.

The paradigm shift to a transdisciplinary model has advantages that make it of value for learning language and for learning in general. The transdisciplinary approach provides an open and flexible framework for dealing with complex global issues, the discussion of which challenges learners to attempt more advanced forms of expression. Instead of limiting or restricting a topic, it focuses on it and opens it up to wherever the inquiry will lead. Learner choice is of importance; and choice creates motivation. The learner has choice with respect to topic (choice of an environmental problem), process (organization of group work), and ways of thinking about topics (types of thinking).

Furthermore, the TD approach in the selected project requires different types of thinking –rational inquiry, problem-solving, intuition and imagination, and thinking about the process.

Rational inquiry—the research and absorption of information or data—involves "declarative thinking." Information analyzed with a particular objective in mind (problem-solving) is a different type—"procedural thinking" (thinking about how to solve the problem—asking the question "how?"). If thinking is open-ended, "divergent thinking" is involved (thinking about "why" and "what if?"). Metacognition is thinking about and discussing the thinking process ("how are we thinking about this question?") (Pogonowski,1989). Hypothesizing and defending the hypothesis with a structured argument also combines procedural and divergent thinking. The flexibility which learners acquire with respect to thinking is of critical importance. Having reflected and problem-solved in these ways about issues of the environment, learners may perhaps not be stymied by them in the future; habits of flexible thinking are transferable to other complex and multidimensional issues. An objective of both transdisciplinarity and scaffolding is that, in addition to finding out about the French language and the environment, learners will learn something about themselves and how they think.

Conclusions

In this study, which focuses on scaffolded instruction to spiral students from Intermediate to Advanced level tasks in order to improve functional competency in the target language, the shift to a transdisciplinary paradigm was seen to have a number of advantages. Transdisciplinarity is of value because it provides a natural vehicle for language functions that speakers need to practice to move to succeeding levels of proficiency. We have found that as motivated learners attempt to share complex knowledge and ideas which are relevant and of importance to them, they avail themselves of new strategies scaffolded by the instructor to express themselves, and become more functionally competent in the target language. By scaffolding tasks, the instructor can rapidly spiral Intermediate speakers to Advanced Level tasks. Specifics targeted in the environment curriculum are moving from personal subjects to subjects of general interest; dealing with a complication; accuracy (tailoring of language)(detailed and precise concrete description and narration); use of extended discourse; narration in past present and future time frames; fluency; and structuring argument when supporting opinion or presenting a hypothesis. It is assumed that scaffolded instruction in a TD framework can propel learners to more advanced tasks, not only at Intermediate High, but also at different levels of functional proficiency.

There are additional advantages to the TD approach. The flexible framework suits the curricular content in the context of French language, and indeed, world language instruction. The issues of the environment are open, global (trans-national), trans-linguistic and trans-cultural. In addition, as learners grapple with difficult issues, they can focus their inquiry on a topic as opposed to a specific discipline. Transdisciplinarity imposes no limits on research; for that reason, it lends itself to the study of evolving problems and solutions. It demands flexible thinking; these types of thinking we have labeled as declarative, procedural, divergent and metacognitive. The TD approach encourages inquiry-based learning, that is, learning by discovery. Students research authentic documents in the target language. They are encouraged to question, compare and evaluate these documents, always to question, and to think critically about what they are discovering. Practice discovering, questioning, thinking critically, and problem-solving are transferable skills that will be important for life-long learning.

In addition, the TD approach as applied to the environment curriculum causes learners to practice social interactions. Because learning is project and group-based, peer learning and teaching takes place. As groups inquire, discuss, and choose topics, a process of social interactions happens within each group, and skills are developed, not only in functional competency in French but also in cooperation and leadership. Skills of self-and peer-analysis (critical thinking skills) need to be honed and refined through the trimester, so that peer assessment is possible at the end of the unit. Peers who can evaluate peers and provide a rationale demonstrate that they mastered the requirements. Not only are learners developing new functional competency in French: working in the target language, they practice social interactions and transferable skills, such as questioning, persuasion and leadership skills. Through this process they advance as French speakers; they also develop as Subjects, that is as thinking human beings.

In summary, a paradigm shift from disciplinary to transdisciplinarity using scaffolded instruction clearly benefits oral functional competency in our French classes. Learners advance to a higher level of proficiency, expressing themselves more competently in French, as measured by the ACTFL Proficiency Guidelines. They practice habits of flexible thinking - transferable skills that will be useful for life-long learning. Characterized by rigor, openness and tolerance, the transdisciplinary paradigm allows learners to transition from the familiar to the unfamiliar, from the personal to the public; to deepen understanding; to express complex, relevant ideas in the target language; to develop transferable social skills, including leadership skills. Once mastery is achieved, knowledge and skills can be shared with peers. Learners improve in French and grow as Subjects. Through the process, the transdisciplinary paradigm breaks down conventional boundaries and juxtaposes rational inquiry with a revalued role for intuition and imagination. This allows learners to begin to understand and confront the complex global issues of the twenty-first century.

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