

Using process studies in translator training: self-discovery through lousy experiments*

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Abstract

One of the justifications for research on translation processes is that it will be of use in the training of translators. Very little work, however, has been done on the actual ways in which research can be used in training. This article explores the most direct mode of application, where actual process experiments are carried out in the classroom. Three such experiments are reported on: one on the use of online machine translation, another on translator styles, and a third on the effects of time pressure. The quantitative and qualitative results of the experiments indicate that this approach can be highly effective in stimulating students to find out about their own translating, and rather less than effective as a means of producing valid research findings. The direct use of research in the classroom should thus be considered of qualitative interest to the individual student rather than quantitatively valid as a way of producing knowledge of the general.

1. Introduction

Knowledge on translation processes, as opposed to translation products, has grown in recent years thanks to the use of think-aloud protocols, keystroke recording, eye tracking, and other methods. The research done at the Copenhagen Business School has played a leading role in this development, and Professor Arnt Lykke Jakobsen has been a major creative force behind that innovative work. Here we cannot pay adequate homage to his leadership by adding anything significant to the stock of knowledge about translation

processes; our role is merely to suggest one way in which process research might find a use in the training of translators.

Empirical work can be applied to the training situation in several flavors. An exemplary mode would be the *TransComp* project to study students' progress longitudinally (Göpferich 2009), which will give information on long-term learning processes and might thus justify a developmental model of competencies. A simpler and more direct mode of attack is to review all experiments comparing novices and professionals on a wide range of performance variables (the body of research is already considerable), to collect the significant differences, and to organize those differences in terms of a set of learning objectives or competencies. After all, if we can say what the differences are between novices' and professionals' performances, then we can presumably say what students need to be trained in, albeit without information on sequencing. A third procedure, far more direct and perhaps of more limited applicability, is to have students engage in rough experiments as part of the training process itself, both as a means of self-discovery and as an approach to learning about research. This third mode of application (there are no doubt others) is what we report on here.

We are by no means the first to venture down this path. Juliane House (1986, 2000) long ago pointed out that having students translate in pairs or small groups (“translation in and as interaction”) was not just good for think-aloud protocol research – it was good for the students' learning processes as well. Fabio Alves (2005) reports on the use of *Translog* in the classroom, detailing a series of activities where each cycle of translation–analysis–discussion accounted for some 10 credit hours. And then there are many authors who point out the benefits of process-based activities, focusing not just on what students write but also on how they go about making decisions.

The kinds of experiments that we report on here are different from those antecedents in several important respects. Like House, we wanted to encourage talk between students, but we were not prepared to devote class time to recording and analyzing protocols – the talking and reporting had to be one-off and quick. Like Alves, we wanted students to look at their translating critically and to develop a meta-discourse of some kind, but we were not able

to spend 10 hours putting students at ease with *Translog*, nor another 10 hours per translation plus analysis. Finally, perhaps like all good teachers, we could have mobilized a battery of tricks to raise awareness of complex decision-making processes, but in this case we especially wanted the tasks to look and feel like empirical research. Slick, quick, and yet empirical. The reasons for these desiderata lie in our particular institutional setting.

2. Three experiments

2.1. *The institutional setting*

The experiments we are about to present come from the 2008/09 Translation Practicum course for second-year Masters students at the Graduate School of Translation, Interpretation and Language Education at the Monterey Institute of International Studies in California. The Monterey Masters programs are highly focused on the training of top-flight professionals, and they are very expensive, as some students do not hesitate to point out. On the basis of economics alone, each class has to be justified as progress toward a professional goal. Any methodology that requires 10 credit hours per translation would obviously be a very hard sell. Hence our interest in relatively quick tasks, with a special emphasis on students being able to discover something as a result of each class. But why then our concern with interaction? And why the empirical?

The general aims of the Practicum course, described in the handbook, were to make the students 1) self-critical of their translation processes, and 2) aware of the contributions of new technologies to the actual act of translating. However, the non-official aims were perhaps more interesting.

The Monterey Masters courses are structured around separate language programs, which means that the students in different groups rarely have the chance to interact with each other in translation or interpreting classes. For example, the Korean students (all from Korea) tend not to find out how any of the other students translate, nor vice versa. One of the social and pedagogical aims of the course was thus to make students aware of their different cultural backgrounds and their quite different approaches to translation. Students had

to start talking with students, as should happen in any humanistic education in an intercultural context. Hence the need for interactive tasks.

At the same time, the translation and interpreting courses at Monterey have traditionally been based on a model where excellent practicing professionals teach small groups of excellent students, as a kind of institutionalized apprenticeship. That model requires no extensive translation theory, no translation research, and not much technology. However, the institute's gradual merger with Middlebury College has required that this approach undergo a process of "academization" (a term mistrusted by most professional translators and interpreters). This basically means looking at theory and academic investigation, as well as at the professional practice of professors – the Masters are also supposed to train students in the basics of research. That is, at the very moment when European university education is moving toward the criteria of professional training, Monterey has been trying to move toward the academy. Hence the special concern with meta-discourse and empirical methodology.

The class group comprised 19 students from different language programs (7 Chinese, 5 Korean, 1 Japanese, 6 French). The Japanese "student" was actually a fellow teacher auditing the course. The instructor was fluent in no Asian language and was thus in a highly anomalous pedagogical situation from the outset. How can you help students learn about their translating when you do not know their languages? "Didactic translation" exercises were obviously excluded; some kind of peer-based activity was going to be needed; this would have to be a course based on students discovering things among themselves.

Further, these students were from extremely diverse backgrounds: some had had several years of training as translators; others had previous degrees in science; still others had work experience in the military or in IT. Some had strong bilingual language skills (they could choose between two L1s in the activities); about half the students had English as their L1; others still had some problems with English grammar. For any researcher interested in controlling variables and getting great p-values, this would be the group from hell. On the other hand, all the students were intelligent and highly motivated,

and their diversity might yet be representative of the many kinds of situations that translator training can involve.

Following the first contact hour (described below), the students selected the aspects of translation processes that they wanted to work on. The course was then structured around that selection, with experiments on machine translation, translation memories (Wordfast, Trados), reviewer styles, translator styles, spoken vs. written translation, and translation procedure analysis, along with non-experimental topics such as ethical problem-solving and a survey of pay scales in different countries. The second half of the Practicum, not described here, looked at translation products, with a particular emphasis on corpus analysis.

Below we present reports on three of the experiments: the very first one, then one from Week 7, and another from Week 8.

2.2. Experiment 1: the Google challenge

The first experiment was conducted in the first hour of the first class, with all attendant confusion and technological hitches. The aim was basically to demonstrate to students that 1) these classes were going to be practical but quite different from their other translation classes, and 2) there were things that they could discover about themselves and about technology. Each language group was divided into two (giving a multilingual Group A and a multilingual Group B). The class instructions were as follows:

Please translate the following text for publication in an online dictionary of technical terms, to be used as a general reference source.

Group A should translate just using Internet reference sources.

Group B should feed the text through Google Translate (http://www.google.com/translate_t#), then review and modify the output.

Since we are interested in how long these processes take, please work at what you consider your normal pace. You will be stopped after 12 minutes.

Your source text is as follows:

3D printing

The making of parts and products using a computer-driven, additive process, one layer at a time. 3D printing builds plastic and metal parts directly from CAD drawings that have been cross sectioned into thousands of layers. It provides a faster and less costly alternative to machining (cutting, turning, grinding and drilling solid materials).

Used for making both prototypes as well as final products, 3D printing evolved from the “rapid prototyping” industry, pioneered by Chuck Hull of 3D Systems in the mid-1980s.

Concept, Prototype and Final Product

Capable of making a part from scratch in just hours, 3D printing is used to create models to determine if a design meets the customer’s concept and expectations. It is also used to create prototypes of parts to test their form, fit and function with other parts in an assembly.

The time limit was stipulated as 12 minutes in order to make students work at a brisk pace, but repeated public extensions were then given so that all subjects except three finished the text within 25 minutes (presumably under roughly the same pressure). The only quantitative variable sought was the total time taken to produce the final translation (i.e. drafting plus self-review). All the French-program students and two Chinese-program students were working into their L2, so there was no level playing field. The text was selected so as to ensure that all students would both understand the subject-matter quickly and yet need to search for some terminology. Following the translation exercise, students formed language-specific groups of two or three in which to compare each MT-based translation with a non-MT based translation into the same language. Each group then reported orally on the differences between the two translations.

The general result of this simple experiment was that there was no significant difference in the time taken with MT and without it, no significant difference between the language groups (see Table 1), and no systematic difference between the qualities of the translations as assessed by the students. The general *quantitative* message was thus that students were not going to lose

any time by working with MT – so perhaps they should consider how this mode of work might affect them in the future.

The *qualitative* findings, reflected in the class discussion, were that 1) translators into Chinese and Korean (our one Japanese translator escaped from this activity) generally reacted negatively to the use of MT, even though this difference is not reflected in the quantitative results (we expected Asian languages to give worse results because the MT databases were presumably smaller for those languages), 2) the translators into French appreciated some of the terminology proposed by Google Translate, 3) all translators complained about the MT misreading syntax and were generally appalled by the resulting wild mistranslations, even though this might be one of the advantages of MT with respect to TM – better a clear mistake than a series of fuzzy matches you have to think about for a while (see Guerberof 2009).

Table 1. Time in minutes of translations done into indicated target languages (numbers of subjects in parentheses), comparing use of the Google Translate machine translation tool (MT) with non-MT translations. The mean for “all groups” is based on all individual scores.

	Chinese (7)	Korean (5)	French (6)	All groups	SD
With MT	25.0	15.3	21.0	20.37	6.02
Without MT	25.4	16.0	21.5	21.80	7.26

This experiment would not hold up to any sort of analysis if judged as a piece of empirical science. The standard deviations are enormous: the fastest subject, a high-tech man working into L1 Korean with MT, took 10 minutes; two translators, into French and Chinese, took 30 minutes for no obvious reason, and the all-time slowest, a perfectionist into L2 Chinese with no MT, took 38 (a long story typical of real life – he had trouble with his laptop, went to the library to finish the translation, and thus avoided the external pressure and saved all kinds of face). These individual differences in turn explain the different times for the various language groups. Further, this was the first time most of these students had reviewed MT output. With greater experience and familiarity, their performances in this mode would presumably become quicker and more standardized. In short, this is not something we would like to publish as research.

The experiment did, however, fulfill a definite pedagogical function. At the very least, students discovered that there are viable technological alternatives to their traditional modes of translating. The numbers also made the slower students aware, indirectly and perhaps politely, that their perfectionist concepts of translation were rather exceptional. More important, all students discovered that their instructor did not know what the results of the experiment would be. On this particular frontier, we were all experimenting.

Following this activity, the group discussed the process variables they wanted to investigate in the rest of the course. The sequence of lessons was then put together.

2.3. Experiment 2: translator styles

We now fast-forward to Week 7. Students have been comparing different TMs, trying out different reviewing technologies, comparing self-reviewing with peer-reviewing, and have had task-based lessons on TM terminology management and electronic style sheets. While discussing the different modes of reviewing, students have been introduced to the concept of translator styles, including the colorful categories proposed by Mossop (2000: 44): translators can be “architects” (lots of planning, some reviewing after drafting), “bricklayers” (lots of planning, lots of cleaning up while drafting), “watercolorists” (minimal planning, some reviewing while drafting) or “oil painters” (minimal planning, lots of reviewing during and after drafting).

We are now ready for some general process analysis, of a simplified kind that can be carried out in 100 minutes (the work time available in a two-hour class). Our basic tool here was a simple screen-recording program (Blueberry’s Flashback system, now called “Flashback Express”) that was available for free and could be mastered in a few minutes. This tool enabled students to record everything that happened on the screen while they were translating, then play back their performance, controlling the play-back speed and counting the time spent on each task. (The tool also allows for voice recording, but we were not using that option.) Here are the instructions:

Your mission, should you decide to accept:

1. Download and install BB Flashback Player (this should really be done prior to the class). Deselect “Capture keystrokes.”
2. Find a respectable online daily newspaper in your L2 (the language you want to translate from). Select a lead (i.e. front-page) story for today. Cut about 200 words from the beginning of that story. (Use Word Count to get the number of words. Select fewer words if necessary. Select something of similar conceptual length or use your normal word-character conversion calculation if you are dealing with characters rather than words.) **DO ALL OF THIS VERY QUICKLY.**
3. Paste those 200 or so words into a Word document, open a TM, and get ready to translate them using the TM. There is no real need to use a special memory or glossary for this exercise.
4. Start BB Flashback. Select RECORD.
5. Translate the text into your L1, doing web searches and reviewing as necessary. Aim to complete the translation in about 20 minutes (we will allow you 25)—so be professional, not perfectionist.
6. Have a 10-minute break.
7. Play back your screen recording. Try to keep a track of how many seconds you spent on the following tasks: a) technical problems, b) reading, comprehending, c) documentation (web searches), d) translating, drafting, e) reviewing after the drafting (not including the correction of typos as you type).
8. Upload your translations and the analysis of your time-on-tasks, plus brief answers to the following questions: a) What kind of translator are you? (Do you plan first, then do the task, or do you do the task, then make changes?), b) Did any aspect of your translating surprise you?

All students did all of that in 100 minutes (these are intelligent students). Only a few had significant technical problems, so those times have been edited out of the data (percentages have been calculated on the basis of the other tasks only). The class group on that day included our Japanese colleague but was missing one Korean and three students from the French program. Irregular attendance is also a fact of life (and would mess things up for the following week’s activity, but on we go.) The results are shown in Table 2.

Table 2. Translator styles as indicated in percentages of time spent on tasks (reading/comprehension, documentation, drafting, post-draft reviewing); letters refer to the language program in which the student is enrolled (Korean, Chinese, Japanese, French).

	K1	K2	K3	K4	C1	C2	C3	C4	C5	C6	C7	J1	F1	F2	F3
Reading	9	23	21	17	10	31	50	15	28	23	20	23	28	11	14
Documentation	37	12	27	0	5	9	6	13	17	14	20	13	20	7	6
Drafting	46	58	47	71	67	53	38	52	50	49	45	53	40	82	38
Reviewing	8	7	5	2	18	7	6	20	5	14	15	11	12	0	42

A major difficulty in this experiment was the attempt to define the separate tasks in a clear way. As predicted by Mossop's categories, some students found that they were revising fragments as they went along, at the end of each paragraph or as part of the general drafting process. In those cases we simply asked them to count the total review time as best they could, without insisting on the "post-draft" criterion. If we were looking for a scientific result, some special count would have to be made of these intermediary stages of review. In the class situation, though, it is enough that each student be able to apply their own consistent criteria. The difficulty of quantifying the review stage actually became a major topic of discussion at the end of the lesson.

Any good translation teacher will object here that we should not use newspaper texts, since they are poor representatives of most real-world translation situations. We are indeed embarrassed by this recourse to convenience. There were, however, several logics in play: 1) in order to have all students going into their L1, texts had to be selected in various source languages, including some unknown to the instructor, 2) these students mainly find employment in government departments where current events are indeed material for translation, 3) the use of very recent news would ideally minimize the differences in prior knowledge of the subject matter – fresh news is presumably fresh for all, 4) we also reduced the risk that a translation of the text was already available on the web (as happens with disconcerting frequency). The text choice was thus supposed to reduce the variables, and might yet be justified on that score.

As it happened, the results shown in Table 2 betray the weaknesses of both the classification and the text-selection criteria. Two outliers are shaded (K2 and F2) because their scores are indeed shady: the screen recording shows that K2 did a great deal of reviewing while drafting but did not count it at all (she would change criteria the following week), and F2 confessed that he chose a subject with which he was exceptionally familiar, and thus ostensibly required no reviewing and only trivial documentation. Both these cases would create problems down the line, as we shall see below.

Despite these clear failings in the experiment design, the students' qualitative self-assessments proved particularly rich and revealing. Six of them chose to use Mossop's terms to describe their translation styles, although none saw themselves as "bricklayers" (the metaphor is indeed hard to grasp). The following are the parts of the comments that refer to translator styles (here we have slightly corrected some students' English, since they were not writing for publication):

K1: I just assumed I was "watercolorist". The result shows that I am.

K2: I found it interesting to see that I spent so much time revising my text. It was not like I translated the whole text and then revised it. I revised the text as I was translating.

K3: I think I am an oil painter kind of translator. Actually, I am always trying to plan first and then start translating, which is what I learned to do. However, I always fail to plan perfectly.

K4: I read briefly to get the summary of the source text. And then get right into the translation, even before looking up the words. And then I look up the words and then revise.

C1: Based on the recording, apparently I don't plan before translating. I read the text as quickly as I can, then start to translate segment by segment if I can comprehend.

C2: I think I am an "architect" because I spent the majority of my time on pre-drafting and minimal time on post-revising.

C3: I plan first and do the task. Before this experiment, I didn't notice that I spend a lot of time on comprehending and don't go back to make changes often. This surprised me a lot.

C4: I'm more of an "oil painter" translator. I typically skim an article for context prior to translating then end up doing a good deal of the research/glossary building during translation and a lot of editing after translation.

C5: I prefer to get into the translation right away without previewing the whole article first and then do the revisions. I can translate quite quickly with the pressure of limited time.

C6: I always do the task first while making changes at the same time. I was a little surprised that I spent only 37 percent of the time on translating.

C7: I found the watercolorist style best describes the translation job I recorded myself doing.

F1: Unless it's a technical text, I tend to do the task, then make changes.

F2: For this particular text, I was able to translate first, then make changes after because it's a topic with which I am somewhat familiar in both languages.

F3: It appears that I am an oil painter at heart, putting minimal work into the planning stages and significant effort into the revision stage at the end.

When you go from these self-descriptions to the data in Table 2, the concept of translator styles does make some sense. However, when I try to identify the styles on the basis of the data alone, nothing statistically significant leaps out (although I hope someone will prove me wrong). This could indicate that the time-on-task categories would have to be far more sensitive if they are to correspond to any "styles" with pretensions to psychological reality. Mossop's categories are great for getting students to talk about how they translate, but they would appear not to have much empirical virtue beyond that.

The students' comments also contained some revealing self-criticisms:

K1: It was interesting to see how little time I use for comprehending and revising. I get comments from professors that my accuracy is not good enough that they ask me if I am paying enough attention to reading. They were right! I should do that more!

K2: I feel that I need to increase my time for revising.

K3: I did not know that I spend such a long time on web searching. But I don't spend enough time on revising.

C1: I spent too much time on the technical preparation.

C2: My way of translating seems too slow. I should spend more time on revising.

C4: I think increased use of Multiterm will help speed up the process, especially for automatically inputting proper names.

F1: I was surprised at how long it took me to do it. And I don't think my translation is sufficiently colloquial.

F2: What surprised me most was my typing speed. I know that I do not generally type very fast because I was never trained in typing properly.

F 3: One basic thing that became obvious was that I make a good number of typos (about 3-5 every sentence), which I fix immediately.

One student provided an explanation for the results, suggesting that a particular translator style might correspond to work between unlike languages:

C4: Because of the ordering of information in a Chinese sentence, I have found that it is safer to get it down in awkward English first then worry about restructuring the English sentence later, otherwise I risk omitting details at the beginning of long Chinese sentences.

The data do not allow us to confirm any correlation between language pair and translator style, but the hypothesis remains of interest. Another student found time for a basic segmentation analysis and a small self-improvement program:

F3: I identified a fairly consistent pattern as I translate: I look at the text (5 seconds), type the first part of the sentence (10-15 seconds), read the rest of the sentence (5-10 seconds), and then translate the remainder of the sentence (10-30 seconds). I did not realize that I start translating before I even read/understand the whole sentence. Sometimes I would have to retranslate the first part of the sentence, but not all that often. As a side note, I think the aspect of where the eyes are looking and what the brain is doing during the typing phase is quite an interesting question too. It seemed that in class I would look at what I was typing on the screen and think about that before moving on to the next part of the sentence. A very segmented approach. After class, I wanted to work on a translation while keeping in mind the issues that came up during this exercise, and I tried focusing on reading ahead and understanding the second part of the sentence while still typing my translation to the first part – all while making an effort to eliminate typos too. It was a challenge (which is another reason I'm pretty sure I hadn't been doing it much before) but it also felt like my translating was much more fluid and somewhat faster.

If we are looking for the pedagogical virtues of process analysis, this student's comments are about as good as it gets. In fact, all the students' responses were generally much better than our research design.

2.4. Experiment 3: time pressure

A week after the above experiment, the group was asked to perform exactly the same task, but faster and in pairs (two students had to translate the same text, then compare results in order to get some rough assessment of translation quality). On the basis of previous research on the time variable, we believed that most students would be able to work about 25 % or 30 % faster without a great loss in translation quality. As in the previous experiment, we advertised a

time limit (actually set at 35 % faster) and then we did not apply it rigorously (to allow the translations to be completed). Here are the instructions:

Today's task is the same as last week's except that you have to go 35 % faster and you will work in pairs (i.e. two of you will translate the same text). Your mean time last week was 19.2 minutes, so your time for this week is 12.48 minutes. Here are the steps:

1. Form a pair with someone going into your preferred target language.
2. Both of you should find a respectable online daily newspaper in your L2 (the language you want to translate from). Select a lead (i.e. front-page) story for today. Cut about 200 words, or a rough equivalent in characters, from the beginning of that story. (Use Word Count to get the number of words. Select fewer words if necessary. Select something of similar conceptual length if you are dealing with characters rather than words.) **DO ALL OF THIS VERY QUICKLY.**
3. Paste those 200 or so words into a Word document, open a TM, and get ready to translate them using the TM. There is no real need to use a special memory or glossary for this exercise.
4. Start BB Flashback. Select RECORD.
5. Translate the text into your L1, doing web searches and revising as necessary. Aim to complete the translation in 12.48 minutes, since that is the time after which you will be stopped.
6. Have a break.
7. Play back your screen recording. Try to keep a track of how many seconds you spend on the following tasks: a) technical problems, b) reading, comprehending, c) documentation (web searches), d) translating, drafting, e) reviewing after the drafting (not including the correction of typos as you type).
8. Upload your translations and the analysis of your time-on-tasks, plus brief answers to the following questions: a) Did the faster translator make more mistakes than the slower translator? b) What differences can you see with respect to the time-on-task analysis you did last week? c) What recommendations would you give to a translator who wanted to know how to translate faster without making excessive mistakes?

The mean time for these translations was actually 35.38 % faster than for the previous exercise, with the slowest translator (C7, a self-described “watercolorist”) showing a gain of 16 %, and the fastest claiming a gain of 58 % (C4, an “oil painter”). The general shifts in percentages per task are shown in Table 3 (student K4 has disappeared because she was not in class).

Table 3. Shifts in percentages of time per task, comparing unpressured translation with time-pressured translation. Gain shows the percentage by which the faster translation was faster.

	K1	K2	K3	C1	C2	C3	C4	C5	C6	C7	F1	F2	F3	Totals
Reading	+9	-23	+7	+4	-9	-2	0	+8	-9	+16	-13	+5	-8	-16
Doc.	-25	+8	-7	+3	0	-1	+9	-17	+2	-8	-15	+9	-4	-47
Drafting	+19	-18	0	+11	-10	-1	+7	+14	+21	-5	+21	-14	+26	+71
Reviewing	-3	+33	0	-18	+19	+5	-16	-5	-14	-3	+7	0	-14	-8
Gain (%)	31	38	26	41	37	38	58	38	48	16	48	-2	43	

The totals for the percentage shifts suggest that speed was achieved by cutting down on documentation, initial reading, and reviewing. The variation between the scores for each task is nevertheless extreme. Further, student F2 was actually slower in this “fast” experiment, since on this occasion he was not able to choose his favorite subject matter. As mentioned, K2 also messed things up by deciding to count the reviewing time in a different way. This is why these two students (K2 and F2) were marked as outliers in the previous experiment and they have been removed from our comparative analysis of percentages of time on task (Tables 4 and 5) – their scores do not tell us anything significant about translation processes as such.

Table 4. Percentages of time on task at unpressured translation speed (experiment 2) minus outliers.

	K1	K3	C1	C2	C3	C4	C5	C6	C7	J1	F1	F3	Mean	SD
Reading	9	21	10	31	50	15	28	23	20	23	28	14	22.6	11.1
Documentation	37	27	5	9	6	13	17	14	20	13	20	6	15.6	9.5
Drafting	46	47	67	53	38	52	50	49	45	53	40	38	48.2	8.0
Reviewing	8	5	18	7	6	20	5	14	15	11	12	42	13.4	10.3

Table 5. Percentages of time on task at pressured translation speed (experiment 3) minus outliers.

	K1	K3	C1	C2	C3	C4	C5	C6	C7	J1	F1	F3	Mean	SD
Reading	18	28	14	22	48	15	36	14	36	8	15	6	21.6	12.8
Documentation	12	20	8	9	5	22	0	16	12	24	5	2	11.2	7.9
Drafting	65	47	78	43	37	59	64	70	40	60	61	64	57.3	12.7
Reviewing	5	5	0	26	11	4	0	0	12	8	19	28	9.8	9.8

The reduced magnitudes of the shifts and the relative standard deviations now indicate that the students generally gained time by cutting down on documentation and reviewing, but not so much on reading. The students with

the highest time gains tend to be those who originally spent the most time on reading and documentation (the relative “architects”), but this is only because they were the slowest in the first translation. None of this is anything to write home about. More importantly, none of the students reported that the faster translation was of significantly worse quality. They were thus generally prepared to accept that more time does not automatically equal higher quality, and that all of them could speed up their normal translation processes.

The comments were once again more revealing than the numbers. Here we give the main observations by each student, indicating in square brackets those whose previous self-descriptions used one of Mossop’s metaphors:

K1: I spent a lot less time researching. When you have a time limit, your efficiency goes up and you just focus on the text.

K2: I spent more time on reading and translation compared to last week.

K3 [“oil painter”] In the timed translation tasks, I focused on understanding the context and tried to make sentences simple and clear, which in turn helps readers understand with ease.

C1: Generally, both of us spent more time on translating and no time on revising.

C2: This time I spent less time on reading and translating [he increased the percentage of reviewing].

C3: With time pressure, I didn’t have much time to consider if I had used the right characters or phrases and some spelling mistakes might be found in this translation.

C4: [“oil painter”] More [percentage of] time spent on documentation and translation; significantly less [percentage of] time on revision.

C5: [“oil painter”] I just caught the rough meaning of the sentences and got to the translation right away in order to finish the translation before the time limit.

C6: [“oil painter”] First, I had to speed up the process of translation by reducing the time spent on documentation and revision. Second, more multitasking work is required in speed translation, which involves reading, comprehension, web searching, translating and revising in a single process.

C7: [“watercolorist”]: With the time pressure, I tried to do as little documentation as possible. I tried not to look too deeply into the meaning and the implied meaning of a word and term.

J1: The difference was that I spent a higher percentage of time on “documentation” (word research) than “reading”, compared to last week. What it meant was that, instead of understanding and translating the text as a part of co-text and context, I use a more word-for-word strategy. But the text I used this time was on the stock market, and I just did not know exactly how to phrase terms in my language, which in turn meant looking up a lot of words in dictionaries and spending a lot of time on documentation.

F1: I spent much less time on documentation this week, and revised while I translated. I would have liked to have time to finish and go back to some parts that I didn’t feel like I rendered accurately.

F2: I think I would tell a translator to do as I say and not as I do, as it were, meaning spend less time researching and possibly less time reading, and just dive right into the text and start translating it and then make sure to leave some time for revisions.

F3: [“oil painter”] Looking just at percentages, the proportion of time I spent on translation in the second week almost doubled, the reading time was nearly halved and revision time decreased somewhat. In absolute time, though, I think it is interesting that the number of seconds I spent translating was practically the same in both exercises. That would suggest that even without a time constraint, I work about as fast as I can during the translation phase and then use the revision phase to clean everything up. There is, though, the factor of the reading and comprehension, which during the first week seemed like discrete units but under time pressure blended much more into the translation phase.

Once again, the students’ assessments seem more astute than our research design. As C6 and F3 both suggested, the blending of categories under time pressure does indeed show in the screen recordings but not in our numbers. Worse, since the in-class discussion was based on percentages rather than absolute times, there was no real chance to talk about the possibility that drafting times remained fairly constant, as predicted by F3.

Some students also made a series of recommendations based on their analysis:

C5: I think the secret of translating faster is not to hesitate for too long before starting to translate and make revisions afterward so you won’t waste too much time getting stuck on the phrases you have problems with.

C6: If they really want to speed up their translating process without major meaning shift or error, they should focus more on reading comprehension and try to be more linguistically flexible.

C7: What I recommend is try to cut from the documentation part and the revision part, but not the reading and comprehending part if the translator wants to make as few mistakes as possible.

F1: For a person trying to translate quickly, I would say to avoid documentation if at all possible, and do some revising at the end to revisit those sections that were difficult or about which there were some uncertainties.

F3: Translate quickly and save time at the end to revise – but set some sort of deadline so that not too much time is spent revising.

J1: My recommendation is [usually] to do the research “in the middle of or together with the translating process”. But as the results show today, this strategy did not really work out, so probably translating first and going over your own translation (reviewing afterwards, including doing some research on uncertain terms) may be better.

Perhaps the only constant in the recommendations is the enhanced awareness of the review phase and its importance. Two students (C6 and C7), who had very different translator styles but who discussed this together, nevertheless recommended more focus on the reading and comprehension phase. Several different “ideas for improvement” were thus extracted from the exercise, and the instructor was in no position to say if any of these ideas were more correct than the others. The students were free to experiment and observe, ideally in all their future translations.

The final part of this class activity, actually in the following week, was to have the students read some pages from doctoral research on the time variable (Jensen 1999; Jensen & Jakobsen 2000), particularly with respect to the discussion of coping tactics. The students were thus able to read the research with reference to their own prior experience, and to use the research to further develop their reflection on that experience. In the process, they learnt not only about their own translation performance, but about (good and bad) research designs as well.

3. Conclusions

Although we have presented numbers that look like empirical research, our purpose has not been to formulate any findings about the translation process. The only conclusions we could risk are so general as to be banal: the use of

data-based MT need not slow down the translation process; different translators have different styles; translation can be made faster by reducing the time spent on documentation, reading, and reviewing. The one hypothesis that might be of interest – the faster the translation, the greater the blending of tasks – came from students' observations rather than from anything in the research design as such, and that hypothesis could not be tested with this research design. Under these circumstances, it seems fair to qualify the experiments as “lousy”.

With respect to pedagogical value, however, the use of process research in the classroom surely deserves a far more positive assessment. The use of experiments in this way allows students to make direct observations about their own translating and to draw their own conclusions; students are then in a position to challenge much of what is commonly said about translation (“don't use MT”, “the faster you go, the more mistakes you make”, etc.); they themselves can make a direct transition from translation analysis to the reading and applying of research; they can then decide what to look at next, using research as a set of signposts for their own individual journeys of discovery; and they can investigate the virtues of different research designs, if only by experiencing the limitations of some bad designs. At all these steps, students are made to talk with each other, and only then with the instructor.

Our experience with this approach might also have something to say about the alternatives mentioned at the beginning of this article. The extreme variability of translation styles, both within and between the different language groups, suggests that this has to be taken into account in longitudinal studies of students' progress. The tracking of twelve students (as in the *TransComp* project, which also studies ten professionals) may well give twelve individual cases, the generalizability of which will have to be checked. With respect to the use of process studies to constitute and justify lists of competencies, since that is what our education systems ultimately want, we firmly believe that any resulting lists will be better suited to students' actual learning procedures than are the existing lists based on translation products, exam grading criteria, personal opinion, and the weight of tradition. Process-based lists should definitely include speed, the capacity to distribute effort in

terms of risk, the use of external resources (both written and human), and the key role of reviewing. The obvious problem, however, is that any findings that have been justified on the basis of a fully controlled experimental situation, with a homogeneous student group, wonderful p-values and clear causal logics, may then be applied in pedagogical situations that can be extremely diverse and relatively uncontrolled, both within and between different class groups. The use of experiments in class might nevertheless allow solid science (plus a few of the current idealistic pre-set full-control lists of competencies) to be circumvented to a certain extent: students draw their own conclusions about their own developing competencies, and the group is relatively free to chart its own sequence of short-term learning objectives. In short, the use of experiments can be used to empower the group (as constructivists love to say) and humanize education (as we prefer to say), rather than impose plans and rules that we are far from certain about.

On the basis of the above, the direct use of process experiments may be recommended as a pedagogical exercise, at least in advanced classes where the various technologies actually work. Although we look forward to the day when process research will provide a solid basis for our institutionally guiding lists of competencies (such things cannot be avoided), there is no real need to wait: much of the exciting stuff can be done right now.

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