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# How to teach machine translation post-editing?

## Experiences from a post-editing course

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### Abstract

Advances of machine translation technology have in recent years increased its use in various contexts. In the translation industry, work processes involving the use of machine translated texts as a raw translation to be post-edited by a translator are becoming increasingly common. The increasing use of post-editing processes also raises questions related to teaching and training of translators and post-editors, and institutions offering translator training have started to incorporate post-editing in their curricula. This paper describes a machine translation and post-editing course arranged at the University of Helsinki in Fall 2014. From the teacher's perspective, we discuss experiences of planning and teaching of the post-editing course. The development of the students' experiences and perception of the course contents, machine translation technology and post-editing are also discussed based on reflective essays written by the students after the course.

### 1 Introduction

The development of machine translation (MT) quality has led to growing use of the technology in recent years in many contexts. In the professional context, an increasingly common workflow involves the use of machine translated text as a raw translation to be corrected or post-edited by a translator. Tools and practices for such workflows are being developed in large multilingual organizations, such as the European Commission (Bonet, 2013), and by language service providers who increasingly offer their clients tailored MT systems and post-editing (PE) services. Based on a recent survey of 438 stakeholders in the translation and localisation field, Gaspari et al. (2015) report that 30% currently use MT, and the majority (70%) of the MT users combine that with PE at least some of the time. The use and usability of MT and PE varies greatly in different countries and language pairs, however.

The increasing use of MT and PE workflows in the translation industry has also attracted interest to how translators and post-editors are, or should be, trained. The need for specific training for post-editing has been argued by O'Brien (2002), for example. More recently, based on a review of various translation industry surveys in addition to their own survey, Gaspari et al. (2015) argue that there is a growing demand for MT services as well as a growing demand for expertise in PE skills, and emphasize the impact of "familiarity with translation technology" on the employability of future translators.

To answer to this changing industry landscape, universities training translators have therefore started to incorporate MT and PE in their curricula. In this paper, we describe experiences from a special course focusing on post-editing, arranged at the University of Helsinki, Finland, during Fall term 2014. The aim of the course was to introduce translator students to the theory and practice of MT and PE, covering topics ranging from the technical principles of MT to

PE practice, and research related to PE processes and MT evaluation. This paper presents an overview of the course contents, learning outcomes and the lecturer's experiences from planning and teaching the course. The students' perspectives are also discussed based on reflective essays written after the course.

The remainder of the paper is arranged as follows: Section 2 presents a brief overview of the current status of MT and PE use in Finland to provide context for the course described. Section 3 presents related work on MT and PE in translator training. Section 4 provides an overview of the course itself and an evaluation of the practical organization and learning outcomes. Section 5 discusses the themes arising from the students' reflective essays as well as issues raised during the course. Finally, Section 6 presents the conclusions and some recommendations for future teaching.

## **2 MT and PE use in Finland**

The adoption rate of MT and PE processes naturally varies in different countries and language pairs. For some language pairs, such as English-Spanish, MT systems have already for some time been able to provide sufficient quality to make PE a viable alternative. For some other language pairs, however, MT quality has lagged behind and PE has not been seen as feasible.

Finland is one of the countries where the use of MT and PE has not been particularly widespread. In large part, the situation is connected to MT quality achievable with Finnish as one part of the language pair. As a morphologically rich language with relatively free word order, Finnish has proven difficult for MT systems. For a more detailed discussion of the particularities of the Finnish language related to MT, see Koskenniemi et al. (2012). The quality issues are reflected, for example, in the European Commission trials, where English-Finnish translators considered MT at most sufficient to suggest ideas for expressions or not usable at all and better replaced by translation from scratch (Leal Fontes, 2013). In contrast, for more successful language pairs like French-Spanish, French-Italian and French-Portuguese, most MT segments were rated reusable.

On the other hand, also the small market area has attracted relatively little interest in developing MT systems for Finnish. In addition to free online statistical machine translation systems like Google Translate, the survey by Koskenniemi et al. (2012) mentions only two rule-based machine translation R&D projects, one of which did not reach product stage. A recent survey of 238 Finnish translators found that MT-related skills were not considered important by the translators themselves, which is likely connected to the unavailability and low quality of MT systems involving Finnish (Mikhailov, 2015). The report of this survey does not provide exact numbers on how many respondents used MT systems, but noted that most were only familiar with free online systems, with only three having used systems other than Google (Mikhailov, 2015, p. 111, endnote 5). Development work is, however, reportedly being carried out by Finnish language service providers.

## **3 MT and PE in translator training**

As the use of MT and PE workflows has increased, research on, and teaching of, skills specific to post-editing has become necessary. Part of the skill set is likely to be shared with "traditional" human translation, such as source and target language proficiency, subject area knowledge, text linguistic skills, cultural and intercultural competence, as well as general documentation and research skills (see O'Brien, 2002; Rico and Torrejón, 2012; Austermuehl, 2013). However, PE has been found to differ from human translation as well as revision of human translated texts both in terms of the cognitive processes and the practical goals and processes (Krings, 2001; O'Brien, 2002). This likely leads to there being skills that are specific to PE.

In her proposal for PE course content, O'Brien (2002) adds to the general skills mentioned

above also certain a list of specific PE skills, including general knowledge of MT technology, terminology management skills, knowledge of pre-editing and controlled language, some programming skills, and text linguistic skills. O'Brien (2002) also notes the importance of a positive attitude toward MT, which is brought up also by many other writers (Rico and Torrejón, 2012; Doherty and Moorkens, 2013; Pym, 2013).

Rico and Torrejón (2012) discuss their view of necessary PE skills that are divided into three groups: core competences, linguistic skills, and instrumental competence. Core competences are "attitudinal or psycho-physiological competences", which relate to dealing with subjectivity in PE specifications, client expectations and uncertainty, as well "strategic competence" for reaching informed decisions regarding PE alternatives. Linguistic skills relate to source and target language, communicative and textual skills as well as cultural, intercultural and subject area competence, and instrumental competence involves various technical skills related to understanding MT technologies, terminology management, corpora and controlled languages, as well as some basic programming skills.

Pym (2013) also discusses the general skills necessary for working with MT. He emphasizes the need to "learn to learn", or learn how to pick up any new software quickly, as specific tools and skills related to them soon become outdated due to technological development. Related to this is the skill of evaluating the tools on offer. Another necessary skill set is learning to evaluate the MT suggestions (as well as translation memories) and the usability of segments, learning to make only necessary changes and to discard suggestions that require too many changes. Pym (2013) also suggests some specific revision skills involving detecting and correcting suprasentential errors (punctuation, cohesion) as well as stylistic revision, working as a part of a review team, and revising to a specified quality level.

Post-editing and MT have been included in at least some translation courses, often in the context of translation technology teaching (for example, Kliffer, 2005, 2008; Austermuehl, 2013; Fersoe et al., 2013; Kenny and Doherty, 2014; Doherty and Kenny, 2014). A commercial PE training course with assignments in various languages is also offered by the TAUS resource center <sup>1</sup>. In translator training, MT and PE may also be used as part of larger projects: for example, Shuttleworth (2002) discusses a course involving a large translation project, where MT and PE were used together with translation memory and terminology tools. Torrejón and Rico (2002) describe a hands-on MT and PE exercise for a translation course. This exercise takes the form of a full translation assignment, starting from the definition of the assignment (client, text, schedule, purpose and style of the translation), followed by an error analysis of the MT output and pre-editing the ST to produce a new, improved MT version to be post-edited in accordance with PE guidelines.

Doherty et al. (2012) describe a course consisting of lectures and practical sessions focusing on statistical machine translation (see also Doherty and Moorkens, 2013). The topics forming the course content include introduction to MT history and concepts underlying the systems, MT evaluation, and the role of statistical MT and humans in the workflow (including pre- and post-processing of MT). Doherty and Moorkens (2013) also report on the student evaluations of the sessions, as well as themes arising from experiences during the course.

Kenny and Doherty (2014) also discuss some of the specific things translators should understand about statistical MT, where human translators fit in the workflow and what interventions that may be fruitful. Doherty and Kenny (2014) examine how these aims can be operationalized and included in translator training syllabus. The syllabus outlined in Doherty and Kenny (2014) covers both translation memories (TM) and MT, and includes topics such as basic concepts and implementation, evaluation of tools and MT output, pre- and post-processing, as well as professional issues like ethics, payment and collaboration.

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<sup>1</sup><https://postedit.taus.net/post-edit/training-certification>

Flanagan and Christensen (2014) describe a MT and PE course module consisting of two workshops introducing the translator students to MT and PE, and two PE assignments. The assignments involved PE according to PE guidelines where two different PE quality levels are defined (TAUS, 2010), and Flanagan and Christensen (2014) discuss how the translator students interpreted and followed these guidelines in their assignments.

To the best knowledge of the author, courses specifically focusing on PE have not been previously offered at Finnish universities, although PE exercises have been incorporated as parts of translation or translation technology courses. One example of such an exercise is discussed by Salmi and Koponen (2014). The exercise involved a for the students to translate a passage of English newspaper text into Finnish using two different MT systems, then compare the results and post-edit the version they considered easier to edit.

## **4 Course description**

The course on post-editing was arranged at the University of Helsinki in the fall term 2014. It is an intermediate level course offered as part of the Translation Studies curriculum, and can be taken either by Bachelor's level students as part of their minor, or by Master's level students as a specialized course. The practical organization of the course consisted of seven two-hour lectures, five homework assignments and some in-class exercises, and a reflective essay written at the end of the course. The Moodle platform was used for distributing materials and collecting assignments.

The following subsections describe the students who took part in the course, the objectives of the course and the topics covered, and the practical exercises.

### **4.1 Students**

The course was attended by 15 students, 13 of whom completed the final reflective essay. Translation Studies courses offered at the University of Helsinki are not limited to translation in any specific language pair or students of specific languages, but rather intended to support the studies of various language and translation-related majors. Therefore, the students' study backgrounds included various language and translation subjects (English, German, Russian, Swedish and Nordic languages, Baltic languages). One of the students was from a more technical background, majoring in Language Technology. The language of teaching in the course was Finnish. The students were native speakers of Finnish, with the exception of one non-native speaker, also fluent in Finnish. All were fluent in English.

### **4.2 Course objectives and topics**

The course aimed to introduce the students to the use of MT and PE in the translation industry, as well as research in the post-editing field. The course combined both theoretical background and practical exercises. The topics covered during the course include:

- Theory and history of MT and PE
- Practical use of MT and PE
- Controlled language and pre-editing for MT
- Post-editing without source text
- Post-editing process research
- Post-editing quality levels and guidelines
- MT quality evaluation and PE effort

- PE competences

In line with some of the recommendations and proposals discussed in Section 3, it was considered important to provide the students with knowledge of the theoretical principles of MT, as well as historical and practical context to the use of MT and PE. In particular, the outline can be compared to Doherty and Kenny (2014). The second topic, practical use of MT and PE, addressed also some of the professional issues brought up by Doherty and Kenny (2014), such as ethical questions and compensation in relation to the use of MT and PE. No lectures or practice on programming in general or building an MT system as such were included due to the limited course time and resources. On the theoretical side, we also considered it useful to provide the students with an overview of research concerning PE processes and competences, particularly the commonalities and differences compared to translation.

The theoretical material covered during the course was supplemented with five homework assignments involving post-editing machine translated texts and evaluating the quality of the machine translations, as well as some practical in-class exercises. The languages used in the exercises were mainly Finnish and English, with most post-editing done from English into Finnish. For some exercises, the students were offered options for using some other language pairs in the exercises.

### 4.3 Course assignments

The course assignments, as well as the texts, MT systems and other tools used are discussed below. Some general observations about the assignments and students' comments are discussed in Section 4.5. As part of each assignment, the students were also asked to write a brief comment, which they could then later use as a starting point for their reflective essays.

**Comparison of MT versions:** The objective of the first assignment was to familiarize the students with different types of MT systems: rule-based MT and statistical MT. The theoretical background to these MT principles was discussed in the lecture preceding the assignment. To observe the differences in action, the students were given two MT versions of the flu treatment text, provided as MS Word documents. One MT version was produced using the a statistical system (Google) and one by a rule-based system (Sunda). The students were asked to compare the two versions, examine their differences, and then post-edit the version they considered easier to edit. For this exercise, the students were instructed to produce a translation that could be published on the Internet for any reader looking for information on the flu, but no explicit PE guidelines were given.

**Pre-editing:** The objective of the second assignment was to introduce the concept of pre-editing. The students were given a brief overview of potential issues and a summary of commonly used English Controlled Language rules. They were asked to take at least five of the most problematic sentences from the text used in the previous assignment, try rewriting the sentences following the Controlled Language rules presented, and translate the rewritten versions with the MT systems used in the first assignment. The option of machine translating the sentences to some other target language was also given. As a further in-class exercise, the students were also able to use the terminology editor included in the Sunda tool in order to test the effect of user-specified terminology on the MT output.

**PE without source text:** The third assignment involved a scenario where the post-editor has no access to the source text. The students were introduced to research investigating the potential for such a scenario and its possible practical uses. For the assignment, they were given only the raw Finnish MT version of the dish washing liquid text, translated by the European Commission system. They were instructed to edit it so that it was grammatical and conveyed the meaning as they understood it; publication quality was not required. The text was again provided in a MS Word document. The students were also asked to track and report their own

time use in this assignment.

**Quality levels:** The objective of the fourth assignment was to introduce two different PE quality levels. The students were provided with the TAUS guidelines (TAUS, 2010), where two quality levels are defined. For the assignment, they were asked to post-edit two text passages, one according to the guidelines for “good enough” quality (semantically correct, no information added or omitted, no offensive or inappropriate content, correct spelling, corrections for stylistic reasons or fluency not required) and the other according to “human translation quality” (grammatically, syntactically and semantically correct, correct terminology, no information added or omitted, no offensive or inappropriate material, correct spelling and punctuation). For this assignment, the two press release passages were used. The students were divided into two groups and the text passages were alternated so that one group edited passage A according to the guidelines for “good enough quality” and passage B according to the guidelines for publication quality, and the text passages were reversed for the other group. This assignment was carried out using the Appraise tool, which also records PE time per sentence.

In class after the assignment, the students were able to compare their own PE time data to others in the class. They were also introduced to the use of edit distance metrics like HTER (Snover et al., 2006), which compare the number and type of changes made during post-editing. The students then examined their own edits using the metrics in Asiya Online Toolkit.

**MT quality evaluation:** The objective of the fifth assignment was to introduce the students to the topic of MT quality and evaluation, and to have them consider the distinction of fluency of language and adequacy of meaning in translation. They were provided with the LDC guidelines for evaluating fluency and adequacy (LDC, 2005), and asked to rank different MT versions of sentences either based on fluency or adequacy. For this assignment, the tourist phrases were used, and the evaluation was carried out using the Appraise tool. The students were offered different possible evaluation tasks in Finnish, Swedish, French, or German.

#### 4.4 Evaluation of the practical organization of the course

Some issues related to planning and teaching the class can be noted. The course was planned to include many different types of practical exercises to provide the students with a wide view of different topics. On the other hand, the limited course time made it difficult to deal with many issues in depth, and some of the topics remained at a rather superficial level. The selection of texts and tools was complicated by the fact that the translator students’ main working language differed, and providing them all with materials specific to their own language pairs was not feasible within the scope of this course. The language pair English-Finnish was settled on for most exercises, as these were languages in which all had at least a good level of proficiency.

For texts to be edited during the course, we aimed to select relatively general interest texts that would not require particular expertise. One text consisted of 17 sentences (263 words) extracted from a longer informative text with instructions for treating the flu, intended for the general public. The second text consisted of 11 sentences (281 words) taken from a European Commission text on requirements for dish washing liquids. The third and fourth texts were extracts from English EU press releases. For the evaluation task, machine translated sentences were taken from the tourist phrasebook dataset described in Rautio and Koponen (2013). The set contains short, simple sentences involving asking directions, making purchases and similar, translated using different MT systems.

The selection of MT systems was limited by the availability of systems for Finnish. In the end, translations used in the PE exercises were produced with three systems: the statistical system developed by the European Commission, a rule-based system by Sunda Systems<sup>2</sup>, and

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<sup>2</sup><http://www.sunda.fi/kaantaja.html>

Google Translate<sup>3</sup>. Texts translated with the European Commission system were included to represent perhaps the most likely intended scenario for PE: using an in-house system to translate specialized texts. The Sunda system is customizable through the use of user-specific terminology, and is reportedly used by some Finnish freelance translators and companies. Google was included mainly due to its familiarity and easy availability, although its usability for real-life PE scenarios is uncertain.

In terms of tools used, two of the PE tasks were given to the students in MS Word document format. One of the PE assignments and the evaluation task were carried out using the Appraise evaluation tool (Federmann, 2012). Although this tool is mainly intended for MT evaluation rather than PE, it provides basic functionality for post-editing sentences, and records PE time, for example. As an additional tool, a class exercise utilized the Asiya Online Toolkit (González et al., 2012), which is an online interface for using various automatic MT evaluation metrics.

The initial plan for the course had been to use a translation memory software for carrying out the assignments during the course. However, due to unexpected technical issues combined with the fact that surprisingly, most students indicated they had very little practical experience with the use of TM tools made their use not feasible during this course. This situation reflects previous observations (Doherty and Moorkens, 2013; Doherty and Kenny, 2014) about the importance of technical resources for teaching, and the challenges related to them.

#### 4.5 Evaluation of learning outcomes

The objective of the PE course module described was to introduce the students to the use of MT and PE in the translation industry, as well as research in the post-editing field. The course aimed to provide the students with general knowledge of MT principles, the use of PE in practical scenarios and related professional issues, and related issues such as controlled language and pre-editing. Further, the goal of the course was to foster a positive attitude towards technology, together with the ability to critically evaluate the tools and processes, both of which have been found important (O'Brien, 2002; Pym, 2013; Kenny and Doherty, 2014). This section discusses these objectives in light of the class discussion as well as the reflective essays written by the students after the course. The reflective essays are discussed in more detail in Section 5.

Based on the first assignment where the different MT versions (rule-based and statistical) were compared, all students appeared to have grasped the basic principles of MT, and the differences between these two approaches. They were able to analyze the types of errors found in each version and reflect them against their understanding of the type of MT technology in question. In general the students found both versions surprisingly understandable, although not perfect. Some said there was “not much” to edit, that the MT provided a surprisingly good starting point, and that they felt post-editing had saved time and was not particularly challenging. Others, however, felt that they probably would have translated the text at least as fast.

The students were also able to assess the use of MT and PE critically. Most students doubted particularly the feasibility of PE without source text, based on their experience. Although they considered the text relatively understandable, they found it hard to trust the MT, and many pointed out that it might have been faster to translate the text using the source text. The students also did not consider pre-editing particularly beneficial. Although the application of some of the rules improved some sentences, or parts of sentences, many errors remained, and many students commented that it seemed rather futile to spend time pre-editing if one still had to do post-editing. They also felt that the introduction to controlled language in the preceding class had not been detailed enough.

The students also appeared to gain awareness of their own editing processes, and evaluate their own work. Most students commented that they found it somewhat difficult to differentiate

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<sup>3</sup><http://translate.google.com>

between the PE quality levels, and to determine what changes were necessary for the “good enough” quality. Examining their own corrections, many commented that they likely were correcting “too much”. The in-class exercise examining the students’ own PE times and edits was overall very well received. The students commented that it was interesting and informative to compare the PE times and examine their own corrections after the fact. The students also commented that the evaluation task, where they rated MT quality focusing on language only or meaning only made them more aware of the issues.

Based on the course assignments and the students’ reflective essays, the course appears to have succeeded in introducing them at least to the basic principles of MT and PE. The students had a positive attitude towards the tools and workflows, but also evaluated them critically. As the course described here was a relatively short (7 weeks), many of the topics could only be discussed on a relatively superficial level. The PE assignments were also relatively short, and more extensive practice will naturally be required to make the students ready for PE work. Nevertheless, the students’ comments also show an awareness of their own editing processes, which will hopefully help them to further develop their skills.

## **5 Themes identified in the students’ reflective essays**

At the end of the course, the students were asked to write a reflective essay on the central ideas and experiences during the course. They were instructed to write a 1000–1500 word essay discussing the theoretical background covered during the course and reflecting on their own experiences and observations from the assignments. As a starting point for the essay, they were asked to reflect on the following questions:

1. How did your understanding of the use of MT post-editing and related phenomena developed during the course?
2. What benefits and opportunities do you see in the use of MT and PE from the perspective of a translator, an organization requiring translation services, an individual MT user? What about problems or limitations?
3. How has the field developed and how do you believe it will develop in the future?

In addition, the students were instructed to raise other issues based on their readings and observations. They were also asked to comment on the course content, practical organization and potential improvements.

These reflective essays were analyzed for themes raised by the students. Similarly to the qualitative evaluation discussed in Doherty and Kenny (2014), extracts of the topics and observations discussed by each student were compared to determine whether multiple students brought up similar issues, and commonly occurring topics were grouped into larger themes. The themes related to the students’ expectations and attitudes toward MT and PE, observations on MT quality and usability, PE processes, PE levels and requirements, the students’ visions for the future of translation and PE, and training. The following subsections discuss these themes in more detail.

### **5.1 Expectations and attitudes**

One clear theme commented on by the students related to their expectations and attitudes before the course, and some of the ways they changed. About half (7 out of 13) of the students stated that they had very little knowledge about MT and PE before the course. Most were at least somewhat familiar with free online MT systems, but as one student stated, the experience was mainly limited to laughing at examples of silly MT errors. One of the students had some prior theoretical and practical knowledge of MT, and another mentioned that the basic principles had



been covered in a prior course taken at another university. One student had worked in a company where MT was in use, although she had not used it in practice.

In terms of attitudes, most did not expect the quality of MT to be particularly high, and had not assumed it would be used, or usable, in professional contexts. Three of the students specifically described their own attitude toward MT as negative at the beginning of the course. Only one student mentioned having a generally positive attitude toward MT and PE. During the course, their perception of MT apparently changed, with most commenting that they saw more potential in MT after the practical experiences of the course.

Student attitudes was also one of the central themes identified by Doherty and Moorkens (2013), and in general attitude toward MT has been considered important in MT and PE related training. In this sense, the course appears to have succeeded in fostering a positive attitude, as most of the students commented on seeing MT in a more positive light after the course.

## **5.2 MT quality and trust**

As noted in the previous subsection, most of the students did not have very high expectations of MT quality. In fact, most of the students (10 out of 13) explicitly stated that the quality of the machine translations handled during the course was better than they had expected. This could already be seen in the first assignment, where students commented that although neither version was “publication-ready”, containing some unintelligible parts, both were more understandable than they had expected. Their comments were even more positive concerning the texts translated using the European Commission system.

On the other hand, although positively surprised by the readability, the students found it hard to trust the MT. This point, which was raised in the essays by more than half of the students (8 out of 13), had also come up in class in connection with the PE assignment without source text. The students pondered whose responsibility the correctness (with regard to meaning) would be, and stated they would not feel secure taking responsibility for the final translation. The trust issue was not limited to this task, and more than one student discussed the slowing effect of constantly having to check the MT version against the source text, looking for potential errors.

It should be noted that although the students appeared to be even somewhat impressed with the quality of the MT used, all the texts still contained various issues, as MT quality into Finnish remains far from fluent. Similarly to the theme of quality thresholds discussed by the students in Doherty and Kenny (2014), the student of this course also identified situations where the MT quality was likely too poor for any intervention to be fruitful. The MT texts, however, appear to be at the level deemed most usable for teaching purposes by Kliffer (2005): not bad enough to contain such frequent low-level errors that PE would be completely pointless, but not such high quality that there would be hardly anything to correct.

## **5.3 PE process and time**

Half of the students (7 out of 13) discussed the unfamiliarity of the PE work compared to their prior experience with translation, and stated that it took time to get used to the idea of working with a “raw” translation. The difficulties mentioned involved, for example, getting used to the MT differing so greatly from a raw version they might create themselves, and having to deal with two sources, the source text and the MT. Some also commented that the sentence-by-sentence way of working imposed by the Appraise tool was difficult, while others found it intuitive. One even stated he started to quite like using the tool.

As could be seen in the third assignment, where the students tracked their own time, their speed varied greatly. Of the 13 who completed the assignment, 4 had taken less than 30 minutes, 5 had taken between 30 and 60 minutes, and 4 students had taken more than 60 minutes to edit the relatively short passage. Some of the differences in PE speed may of course be related to

the students' overall language skills, as the language pair English-Finnish did not represent the main working languages for all of the students. A more detailed analysis of the relationship between language skills, edits and PE times was not within the scope of this paper, but might be informative in the future.

Based on their class comments and the reflective essays, they also differed in how they viewed their time use. Some stated that once they started to feel more comfortable, they felt they were saving time compared to translation from scratch. One student estimated that PE probably took only about one third of the time that translating the same text passage would have. On the other hand, not every student felt the PE was making them faster. One of the students even expressed some frustration and feeling she was still working too slow and making unnecessary changes.

The students' observations can be compared to the findings of the survey reported in Salmi and Koponen (2014), where most stated they either would have translated the same text faster or that there was no difference in time. Only 10 of the 49 students answering that survey felt PE made them faster. In studies where speed in PE versus translation has been explicitly compared, García (2010, 2011) have indeed found that for translation students, PE was only marginally faster. These experiments, however, were conducted with students who had no training in PE, so partly this may be due to unfamiliarity.

Interestingly, one student explicitly connected her PE speed to the amount of experience, noting that the PE probably speeded up her work specifically because she is not yet a particularly experienced translator. She wrote in her essay that if her translation processes had been more established, she might have found it more difficult to work with the MT. No detailed analysis was performed on the students' edits and it is therefore difficult to say how proficient this particular student was, but her self-assessment reflects the observation by García (2011) that the "poor" students benefited more from MT, and that one possible explanation was that they had not yet formed effective translation skills. On the other hand, as García (2011) points out, these students could also have some other characteristics that make them particularly suited for PE.

#### **5.4 Adjusting to PE quality requirements**

As with MT and PE in general, the students indicated that they had relatively little knowledge of the different use scenarios and quality levels for PE. Particularly the idea of "good enough" quality was new to them, and most (9 out of 13) explicitly commented that they had a hard time adjusting to a task where such quality was required. Thinking of the translation as a text that needed to be simply sufficient to convey the meaning needed some adjustment. However, most indicated that after the course, they now had a better understanding of differing situations where a lesser quality of language might suffice. Most also explicitly mentioned that they considered it important to learn to adapt to different requirements.

Most of the students (7) who raised this theme also explicitly connected it to their prior translator training, where the need for "perfect" language is generally emphasized. They found it difficult to accept a translation that was "less than perfect". The students appeared to react to this in two ways. Some wanted to work on the translation until they were happy with the final version, but recognized that they were probably "editing too much", which was also connected to their observations on time use. Referring specifically to the first PE assignment, one student stated her final version should properly be called "inspired by the MT" rather than "post-edited". Other students decided to try to manage only with minimal corrections, and not try to make the text their "own", but expressed concerns about how the often unidiomatic MT affected their final translations.

The concerns about quality of the final translation are reflected, for example, in the survey

reported by Salmi and Koponen (2014), where many of the students expressed similar issues. Their apparent desire to edit the final translation to be as perfect as possible, even if it meant rewriting, however, contrasts with the findings of Depraetere (2010). Based on the analysis of the corrections made by students in a PE project, Depraetere (2010) reports that the students “did not feel the urge to rewrite it”, and did not rephrase the text if the meaning was clear. The observations regarding difficulty of adjusting to the quality levels can also be compared to Flanagan and Christensen (2014), whose students also discussed making potentially “unnecessary” stylistic changes, even when the guidelines called for “good enough” quality. Similarly to those students, our students struggled with adhering to the guidelines related to style. As noted by Flanagan and Christensen (2014), it may also be that the guidelines themselves are not entirely clear.

### **5.5 Future visions**

Since the essay instructions had specifically asked the students to reflect on potential future visions, all of the students did discuss views regarding MT and PE both as a general practice and in their future careers. Of the 13 students, 11 students explicitly stated they believed the use of MT and PE would increase. In contrast with their rather low initial expectations for MT, and even self-professed negative opinions before the course, most seemed to have a much more positive outlook for such future. One student who described her view as very negative before the course even stated she had completely changed her mind on MT. Over half (8 out of 13) of the students explicitly stated that they viewed MT as a tool, not a threat for them as translators.

Nearly all, however, also discussed the limitations of PE, particularly of any scenario involving PE without source text. The essays also reflected a clear understanding that MT and PE are not feasible in every situations, which is an important point related to the need of helping students become also critical users of technology, as argued by Kenny and Doherty (2014).

Some of the students also explicitly commented on how they saw PE as a potential career prospect. Five of the students stated that they could well see themselves doing PE work in the future. Two commented that they would not be interested in PE work; one specified that she was mainly interested in literary translation, where MT is likely to be of little use. The other six students did not comment on PE in terms of their own future plans.

### **5.6 PE training and potential improvements to the course**

Nearly all of the students also explicitly commented on MT and PE related training. In general, they considered the topics and competences covered important, even essential for translator training. Even the students who stated that they did not consider PE an attractive career option for them personally felt the course would overall benefit translator trainees. One of them noted that it was good to know what the work is like, so she can better decide whether to accept potential jobs offered in the future.

As this course was the first time a specific PE course was taught, it was very important to hear the students’ views on how the course contents and practical organization worked. Most stated they were overall very satisfied with the course and found the topics interesting. The chance to examine one’s own PE time data and edits was mentioned as a particularly interesting and useful exercise. Most commonly mentioned improvement was that future courses should include options for more varied language pairs. Some students also hoped that more concrete examples would have been used in introducing topics like controlled language and PE levels, and that there would have been more detailed discussions of specific examples from the edited texts. With regard to specific topics, many found pre-editing least interesting and useful. Some students did not find PE without source text particularly useful, whereas one hoped even more class time had been spent on that topic.

## 6 Conclusion and future teaching

In this paper, we have described experiences from a translator training course focusing on MT and post-editing. The course was taught for the first time during fall term 2014 at the University of Helsinki, Finland. After a brief overview of the context of MT and PE use in the country, and an overview of related work on teaching MT and PE, we have presented a description of the course contents, practical organization and assignments intended to introduce the students to various theoretical topics and practical issues in the field.

Common themes arising from reflective essays written by the students after the course were also identified and discussed in combination with observations and comments from the assignments and class discussions. The central themes identified involved students' expectations and attitudes, MT quality and trust, the PE process and time use, adjusting to PE quality requirements, future visions regarding PE, and PE training. A particularly interesting result was seen in the students' attitudes, in that their generally low expectations and even negative attitudes toward MT before the course appeared to change to a much more positive view. However, they also expressed rather realistic views on the potential and limitations of MT.

The materials and tools selected for the course appeared mostly suitable for the purpose. Although MT quality into Finnish still lags behind many others, the systems used were able to produce translations of the source texts selected with high enough quality to make PE feasible. Two of the MT systems used were known to be used in practice by at least some translators working in the field, which was considered important for a realistic view of the situation. When selecting the MT systems to be used, Google was included due to its familiarity and availability to the students. Interestingly, the survey by Gaspari et al. (2015) has found that the vast majority of their respondents who used MT, used free online MT systems like Google or Bing. Although it is difficult to say whether that includes translators working into Finnish, there is also anecdotal evidence pointing to its use in this country.

Some practical and technical challenges were also observed. The most important challenges relate to the fact that the course is offered to students in all language and translation subjects, which makes it difficult to provide materials for all the language pairs they may be working in. Another issue involved technical challenges, and the inability to use translation memory tools for the assignments.

The course is being taught again in Fall term 2015. Based on the experiences of the course in 2014, we have implemented PE exercises in more varied language pairs. To better reflect the practical scenario, most of the assignments are also carried out using a TM system. The exercise where the students were able to examine their own edits and PE times appeared particularly useful, and we plan to incorporate this aspect already in the earlier assignments. We hope that this may help the students observe their own processes more closely over several assignments. Together with class discussions, they may be then able to try different approaches in the following assignments. The ordering of the assignments will also be reconsidered. In particular, the adequacy versus fluency evaluation task might be more fruitful in the beginning of the course, as it could assist the introduction of PE requirements and "good enough" quality, which the students found particularly hard to accept.

## Acknowledgements

The author wishes to thank all the students for participation in the course, and the European Commission, Sunda Systems Oy, and professor Lauri Carlson for offering tools and materials for use in the course.

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