Translation students' conceptions of translation workflow in a simulated translation company environment

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Translation graduates need organisational skills to be able to cooperate in translation service production workflows. This paper explores the development of translation students' workflow conceptions in a simulated translation company learning environment. Using the standard ISO 17100 as a frame of reference for a content analysis of student essays, two research questions are answered: 1) How does working in a simulated translation company learning environment affect translation students' workflow conceptions?, 2) What kind of workflow conception profiles emerge in a simulated translation company learning environment? A quantitative comparison of essays written before and after a one-year-long translation company simulation course showed a progression from rudimentary conceptions with few workflow task mentions towards more detailed conceptions that are closer to the translation industry model. Further quantitative analysis of the changes in individual task mention values revealed clusters of workflow tasks associated with the duties of two different task roles, the translation specialist and the project manager. The results showed a tendency for some students to stay with the conception associated with the translation specialist role and for some students to develop a workflow conception associated with the project manager role.

Keywords: translation workflow; workflow conception; translator education; translation service provision standard; employability

Introduction

The future professional setting of graduates of translation programmes rarely corresponds to the cliché of a lone translator hammering away on a word processor. Instead, it is likely to be a working environment that consists of networked operations (Risku et al. 2013) and involves an 'interplay of agency between human and machine' (Ruokonen and Koskinen 2017, 311). While translation as 'a solitary craft' (Dunne 2012, 143) that relies on bare-bones translation skills can be found in some segments of the translation market, most graduates will need more than such core skills.

It is no wonder, then, that the discrepancy between translation graduates' competences and translation industry expectations is a recurring theme in industry surveys and academic papers. The risk of a widening 'competence gap' between academia and industry is ever-present as new kinds of expertise are required due to market changes and renewed methods of production (Enríquez-Raído 2016; Drugan 2013, 8–25; Dunne 2012). Despite efforts to keep the competences of translation graduates up to date (see EMT [2017] and Optimale [2013]), it was recently claimed that 'the gap between the academic world and the industry is so wide that, when approaching the job market, translation graduates instantly and bitterly realize they don't know much about the actual work they are supposed to do' (Massardo and van der Meer 2017, 21).

In modern translation service production, several individual skills of human agents are combined with the capabilities of various tools and technologies to set up coordinated production workflows within translating organisations or as extended production networks (Abdallah 2012, 5). A typical business model of a translation service provider (TSP) is structured around the business processes sales and marketing, vendor management and project management, leaving the production stage for external suppliers (Dunne and Dunne 2011a, 5). Novel ways of organising translation into workflows that integrate crowdsourcing and machine translation have been introduced (see, e.g., Jiménez-Crespo 2017; Morera Mesa 2014), but the bulk of translation work is, nevertheless, carried out in conventional translate-edit-proofread (TEP) workflows (Dunne 2011; Jiménez-Crespo 2017, 62–63; Kelly, Ray, and DePalma 2011; Kockaert and Makoushina 2008). According to the 2018 Language Industry Survey (ELIA, EMT, EUATC, FIT Europe, GALA and LIND-Web 2018), '[c]rowdsourcing and offshoring

[…] remain slow starters' and, despite progress made, 'the [machine translation] technology cannot yet be considered mainstream'.

To be able to cooperate in translation workflows, whether novel or conventional, translation graduates will need organisational skills, including the ability to organise and schedule their own workload, and the ability to manage the work of others. While crucial for managerial and coordinating roles, such as sales manager, vendor manager, project manager or coordinator, many of the organisational skills are also relevant for specialist roles like translator, reviser, proofreader, or terminologist. In the 2017 Language Industry Survey (ELIA, EMT, EUATC, FIT Europe, GALA and LIND-Web 2017), organisational skills were considered important or critical for translation-related positions by 80% and for language positions by 60% of the respondents.

In this article, we examine how the understanding of translation workflow, an essential foundation for these organisational skills, develops. For this individual mental map of the actual translation workflow, we use the term *workflow conception*. We analyse translation students' workflow conceptions in a simulated translation company learning environment, the Multilingual Translation Workshop, at the University of Turku, Finland.

Using the standard ISO 17100 (ISO 2015) as a frame of reference, we attempt to answer the following research questions: 1) How does working in a simulated translation company learning environment affect translation students' workflow conceptions?, 2) What kind of workflow conception profiles emerge in a simulated translation company learning environment?

Translation workflow as part of a business process

While translation workflow often figures in TSP marketing, in Translation Studies it has gained attention relatively recently, most prominently in the contexts of

localisation and crowdsourcing (Dunne and Dunne 2011b; Filip and Ó Conchúir 2011; Jiménez-Crespo 2017; Lenker, Anastasiou, and Buckley 2010; Morera Mesa 2014) but also in the context of modelling the business process of translation service provision (Hofmann 2012).

The Workflow Management Coalition (1999, 8) defines workflow as '[t]he automation of a business process, in whole or part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules.' This definition of workflow is geared towards planning information systems, and it focuses on automation. As we are primarily interested in the organisation of work, we would like to emphasise that a workflow may consist of both automated and manual tasks. This is in line with van der Aalst (2013, 1), who points out that Business Process Management (BPM) has a wider perspective on workflows than Workflow Management: it deals with operations management and with the organisation of work as well as with process automation and process analysis. It is in this wider sense of 'organisation of work' we use the term *workflow*. A workflow consists of activities, or tasks. The Workflow Management Coalition (1999, 13) defines activity as a 'description of a piece of work that forms one logical step within a process. An activity may be a manual activity, which does not support computer automation, or a workflow (automated) activity […]'. In the present article, we prefer the term *task,* which is given in the same specification as a synonym for activity.

According to the 'traditional model of translation stages' (Drugan 2013, 77–80), the translation production process consists of three main stages, the pre-translation stage, translation stage and post-translation stage. The pre-translation stage includes the specification of the client's needs, agreement on commercial terms and conditions, planning and scheduling, and management of human and technical resources. The

translation stage includes research, preparation of resources, translation, monitoring, possible reallocation of resources, self-checking and participation in feedback cycles. The post-translation stage covers quality control processes, translator feedback, invoicing, archiving, and project review.

The established workflow model in TSPs for tasks in the translation stage is the so-called TEP process, which is codified in standards for translation service production, such as the ISO 17100 (however, see Garcia [2009, 210]; Drugan [2013, 80], for the possibility that the TEP model may be rendered obsolete due to developments in MT and crowdsourcing). Drugan (ibid., 105–106) points out that, as a result of the impact of new technology on translation workflow, the traditional TEP stage is often significantly expanded to include additional quality assurance procedures.

The ISO 17100 standard as a blueprint for the translation workflow

In the 17100 standard, *translation workflow* is defined as 'processes […], or parts thereof, involved in achieving target language content' (ISO 2015, 1). The concept *process*, for its part, is defined as a 'set of interrelated and interacting activities performed in order to achieve a stated objective' (ibid.). The progression of a translation process workflow is described as a sequence of three main stages: the pre-production processes and activities, production processes and post-production processes. The pre-production processes begin with a stage of enquiry and quotation between the translation service provider and the client, followed by negotiations on the commercial terms of service and the project specifications as well as the preparations for the production process. The production processes include several workflow tasks needed to create the translation and ensure its quality, some of which are required by the standard while others are optional, and this stage concludes with service delivery. The post-production processes include a request for feedback as well as closing administration. A

detailed list of the ISO 17100 workflow tasks is presented in Table 1. Out of the 30

items on the list, 24 include a description, while 6 items do not have a descriptor as their

role is to function as umbrella concepts for sublevel tasks.

[Please, insert Table 1 about here]

The standard focuses on the service provision process and, according to

Gouadec (2010, 270; see also Biel [2011]), who discusses an earlier version of the

standard, the EN 15038, '[t]he basic idea is that the quality of the transaction is "good"

if and when both the provider and providee are satisfied with the translation provision

process and, of course, its result. The stronger assumption is that, if the translator

follows strict relevant procedures, this will reduce the risk of non-quality'. The idea of

client-provider cooperation is reflected in the standard's definition of translation service

as an 'intangible product […] that is the result of interaction between client […] and

TSP' (ISO 2015, 2). The standard's requirement for procedures guiding the production

process emphasises the importance of well-planned translation workflows.

The ISO 17100 standard structure of the translation process is in alignment with

Drugan's (2013) description of the translation stages presented above, except for the

placement of quality control (e.g., revising, reviewing, proofreading), which in the

standard is placed in the second stage production processes.

Workflow conception and workflow concept
While an actual translation workflow can be looked at from an operations

management perspective or an information systems perspective, as stated above, by

workflow conception we refer to a mental model, or a map, that an individual holds of a

generic translation workflow. Workflow conceptions are likely to consist of both

declarative and procedural knowledge, and they can be expected to inform decisions in translation processes. Declarative knowledge refers to knowledge about workflow models and the different stages and tasks of the translation workflow. Procedural knowledge refers to the process 'where the declarative knowledge of the domain, what is known about the task, is converted into production rules, which are like conditional (if-then) statements that specify what problem resolution methods should be applied when certain patterns of events are recognized in a task' (Shreve 2006, 35).

Following Entwistle and Peterson (2004, 408), we distinguish between 'a shared understanding of a "concept" and an individual's personal and therefore variable response to a concept – their "conception"' (for an analysis of the concept–conception distinction, see, e.g., Lalumera [2014]). Thus, the task of translation pedagogy can be seen, among other things, as guiding translation students' workflow conceptions towards a shared understanding, a concept, of translation workflow that approximates the established workflow concept within the translation industry. However, we do not assume there to be just one correct and unchanging concept of workflow that individual workflow conceptions would merely be naïve variations of. Instead, we suggest that in any specialist field of knowledge there will be consensus concepts that represent the current expertise in the field and are subject to change over time.

For this study, the translation industry standard ISO 17100, which has been influenced by major players in the translation industry, can be regarded as a concept of translation workflow, the current consensus model. As a methodological tool for the analysis, we also introduce another concept of translation workflow, namely the shared understanding of workflow within the 'community of learners', the translation students in the MTW.

Translation service provision standards as a resource for translation pedagogy

As one of the objectives of translator education is to foster individuals who can orient themselves in the processes of translation organisations and networks and who are able to create, to re-engineer and to manage such organisations and processes, transferring both declarative and procedural knowledge about translation workflow is an essential function in translator education. As Biel (2011, 70–71) and Sikora (2016, 46) point out, translation service provision standards can be used to prepare translation students for their future jobs in the translation industry. According to Biel (2011, 70), instead of focusing solely on the core translation skills, translation programmes should cover all stages of translation workflow, including pre- and post-production processes. She states that a translation pedagogy that aims to develop the professional competences defined in the standard would ideally include active participation in different roles in the translation organisation, as in-house and freelance translators, revisers, reviewers, proofreaders, project managers, translation company managers, DTP publishers and graphic designers.

The importance of being able to participate in the various stages and tasks of translation workflow and the pivotal role of translation service provision standards is emphasised also in the updated European Master's in Translation Competence Framework (EMT 2017, 11), where the competence area service provision competence covers 'all the skills relating to the implementation of translation and, more generally, to language services in a professional context – from client awareness and negotiation through to project management and quality assurance'.

While it is necessary to include translation provision standards in translator education, it is also good to keep in mind that the ISO 17100 is structured along the lines of the TEP model. Thus, any significant move in the translation industry away from the TEP model towards other kinds of quality models, e.g., 'bottom-up

approaches' (Drugan 2013, 159–181), would affect the status of the standard as a consensus model. This highlights the need to view the challenge of understanding translation workflow broader than as mere knowledge of the conventional TEP style translation process map. The innovative ability to come up with maps for new kinds of workflows and the ability to adjust to new modes of production may prove to be even more critical, especially for those students who aim for project manager or coordinator positions in the translation industry.

Multilingual Translation Workshop: translation workflows in student companies

In the present study, we analyse the workflow conceptions of translation students in a learning environment that simulates work in a translation company. The Multilingual Translation Workshop, MTW, (Konttinen et al. 2017) is a year-long student translation company simulation course at the University of Turku, Finland. The Turku MTW is akin to the Maastricht Skills lab (Thelen 2006) and the Rennes Tradutech (Gouadec 2005), and it is based on the idea of producing translations in self-organised student companies, mainly as simulated assignments but also in some authentic projects. Similar courses exist in a number of European translator education programmes that cooperate under the umbrella of the International Network of Simulated Translation Bureaus (Buysschaert, Fernández-Parra, and van Egdom 2017), and comparable courses have also been realised as online environments (Olvera-Lobo et al. 2005; Olvera-Lobo et al. 2009).

The MTW consists of two separate modules, and it integrates basic translation competence with a wide range of translator competences (Kiraly 2000, 10–14), which have been introduced in preceding courses on translation, translation technology and the translation profession. In addition to strengthening the students' skills in these areas, the

MTW also introduces new themes, such as a business economics perspective on translation as well as translation project management.

In the first module of the MTW, students get to know the workflow by working in different roles in each assignment: as a project manager, translator, reviser, proofreader, terminologist or IT-support. After each assignment, they self-evaluate their success in the given role. In the second module, the students can specialise in some task roles, and one of the assignments of the student companies includes preparing the company for ISO 17100 certification. This means that during the MTW, students can develop both procedural and declarative knowledge of the translation workflow.

Materials and method

The aspect of workflow conceptions that we are primarily interested in is declarative knowledge about the generic translation process workflow. To investigate the topic, we analyse student workflow conceptions against the industry workflow concept using students' verbal accounts of the stages, tasks and roles involved in a translation workflow.

The verbal accounts, our research material on student workflow conceptions, consist of short essays on translation process workflow produced by translation students participating in the MTW. The essays were written at the beginning of the MTW, in December 2016 and in January 2017, and at the end of the MTW, in December 2017. Submitting the essays was a requirement for entering and finishing the course, but they were not used for course assessment. Only essays of students who completed both modules of the MTW were included in the analysis, resulting in 20 essay pairs. As the number of participants in the MTW has varied between 18 and 32 in the year-long MTW cycles carried out since 2015, 20 submissions can be considered a representative number. The data were collected confidentially and with the consent of the participants.

The students were instructed to write 250- to 500-word essays at home within a two weeks' time-frame in Finnish, the native language of the students. They were asked to answer the following questions:

(1) What kind of roles are there in a translation organisation? What kind of tasks are connected with these roles?

(2) What kind of steps are there in the work process of a translation organisation when a client gives it a translation assignment? How can these steps be simplified or made more efficient?

The students were allowed to use all available sources, but they were not explicitly instructed to do so. The mean length of the essays written before the MTW was 262 words, while the mean length of those written after the MTW was 334 words.

The method of content analysis was used to compare the content in the student essays to the task descriptors of the ISO 17100 standard to determine to what extent the essays reflect the workflow stages and tasks defined in the standard. This procedure allowed us to compare the verbalisations of individual translation workflow conceptions to the verbalisation of a collective translation workflow concept, i.e. to compare students' individual translation workflow models to the translation industry consensus model. As the pre-MTW essays and the post-MTW essays were analysed using this same comparison principle, we were also able to discover any changes in the students' workflow conceptions and to gain an insight into what kind of workflow conception profiles emerge in the simulated translation company learning environment.

We used the ISO 17100 standard as a coding frame (Table 1), and only the 24 categories with a description were included in the analysis. The content of each essay was compared to the coding frame. Any mention of a specific task in each essay was coded as representing the corresponding task in the standard, but the sequencing of the

tasks in the essays was not taken into account. For instance, if there was a mention in the essay about how the project manager divides the work and looks for suitable translators, this mention was coded according to the corresponding description in the standard as workflow task 4.6.1.2 Project assignment. Applying this same coding principle to the entire content of the essays revealed which task categories were present in each essay.

A set of coding principles was agreed upon to ensure coding reliability. Each mention of a workflow task was coded only once, at the most detailed level possible. Mentions of different tasks were coded only if they were specific enough. In practice, this meant that text sequences were coded as mentions of identifiable workflow tasks only if more than half of the conceptual features of the standard's task description were present. To avoid any bias in the analysis, each essay was double-coded by two of the three authors independently of each other. Intercoder reliability was ensured by having an equal part of each coder's work overlap with the other coders' work. The double codings were then compared, possible adjustments were discussed, and finally, the definite codings were confirmed.

Results

Pre- vs post-MTW changes in mentions of workflow tasks

Our primary interest in the study was to find out whether there was conceptual change in the workflow conceptions within the student group in a simulated translation company environment. Apart from individual conceptions, a collective workflow concept of the student group was formed as an aggregate of the individual conceptions, and the change in this collective concept was analysed as well. To quantify the conceptual change, sums of task mention codings in the individual student essays before

and after the MTW were calculated for the following units of analysis (theoretical range of the values in parentheses): 1) for the workflow tasks, individual sums for each of the 24 workflow tasks as sums of binary 0 or 1 codings in the student essays (0–20), 2) for the overall workflow concept, the aggregate of the 24 workflow tasks (0–480), 3) for the workflow stages pre-production (0–280), production (0–160) and post-production (0–40), sums of codings in their respective subcategories.

The values for the analysis units were interpreted to reflect aspects of the collective workflow concept within the student group. The change regarding these aspects was calculated as the difference in pre- vs post-MTW values. The statistical significance of the change in the analysis unit overall workflow concept, which is an aggregation of the binary analysis unit workflow tasks and thus measured on a continuous scale, was evaluated using Related-Samples Wilcoxon Signed Rank Test.

The values for the analysis units before and after the MTW are summarised in Table 2. A pre-post comparison of the overall workflow concept shows that after the MTW, the workflow concept in the MTW student group has changed in the direction of the translation industry concept. Before the MTW, the total number of task mentions was 177, which is 33% of the theoretical maximum. After the MTW, the total number of task mentions had increased to 257, which is 50% of the theoretical maximum.

Of the 24 workflow tasks, the post-MTW value was higher for 18 tasks, whereas for three tasks there was no increase and for three tasks there was a decrease in the task mention value. The pre-post differences were symmetrically distributed, as assessed by a histogram. A Wilcoxon signed-rank test indicated that there was a statistically significant increase in task mentions after the MTW (Mdn = 10.50) compared to the task mentions before the MTW (Mdn = 5.00), ($Z = 3.573$, $p < .001$).

[Please, insert Table 2 about here]

For the main stages pre-production, production and post-production, the total number of task mentions was aggregated from the task mentions in their respective subcategories. We can compare these numbers if we accord the maximum value 100% to the case where all students would mention all workflow tasks listed in a specific main stage. The number of mentions increased in all main stages: from 24% (68 mentions) to 41% of the theoretical maximum (115 mentions) for pre-production tasks, from 51% (82 mentions) to 68% (109 mentions) for production tasks, and from 23% (9 mentions) to 45% (18 mentions) for post-production tasks.

These values show that the students' awareness of all three main workflow stages increased during the MTW. Keeping in mind that the maximum value 100% of task mentions would mean that the workflow conception in the student group covers all the workflow tasks listed in the ISO 17100, the pre-MTW percentages indicate a large gap between the collective student conception and the translation industry conception in respect to the three main stages of translation workflow. After the MTW, this gap was narrower for all three stages.

Pre- vs post-MTW changes as indications of workflow conception profiles

We were also interested in any conception profiles that might emerge in the student group. To identify groupings of task mentions that might provide clues to diverging conception profiles, we analysed the change in task mentions in more detail. We plotted the 24 workflow tasks on the coordinate system based on task mention values before the MTW (x-axis) and after the MTW (y-axis) (Figure 1). Figure 1 shows that the workflow tasks form three clusters: 1) high pre- and post-MTW values (cluster 1), 2) low pre-MTW and high post-MTW values (cluster 2), 3) low pre- and post-MTW values (cluster 3).

[Please, insert Figure 1 about here]

We interpret these clusters to reflect the dynamics of conceptual change during the MTW. Cluster 1 consists of the tasks in the upper-right quadrant of Figure 1, i.e. tasks that are mentioned often both before and after the MTW. In this cluster, the workflow tasks 5.2 Project management, 5.3.1 Translation and 5.3.5 Proofreading form a stable subgroup with the highest mention values both before and after the MTW (ranges of values in parentheses; 18–20). The workflow tasks 4.6.1.2 Project assignment, 4.6.3.2 Terminology work and 5.3.3 Revision form another relatively stable subgroup, with somewhat lower pre-MTW values (13–14) but with high post-MTW values (17–20). The tasks in cluster 1 would seem to form the core of workflow conceptions in the MTW student group: before the MTW, the tasks in cluster 1 are mentioned by 85% of the students, and after the MTW they are mentioned by all students. One explanation for the apparent centrality of these workflow tasks could be that they are tasks that any agent in the translation process is likely to be involved with, although from different perspectives. In any case, these are tasks that any translation specialist has to deal with.

Cluster 2, in the upper left quadrant, consists of workflow tasks with relatively low pre-MTW values (1–7) and relatively high post-MTW values (10–15). These tasks include 4.2 Enquiry and feasibility, 4.3 Quotation, 4.4 Client-TSP agreement, 4.6.2.2 Pre-production activities, 5.3.2 Check, 5.3.6 Final verification and release and 6.1 Feedback. Except for the task 5.3.2 Check, taking care of the workflow tasks in this cluster is primarily the responsibility of an executing project manager. The learning effect for the students of the MTW would seem to be especially high regarding the tasks

in this cluster. This may be due to the challenge of taking care of the day-to-day running of the simulated student company. As for the task 5.3.2 Check, it is likely that the students become aware of the need for the translator to carry out self-checking on the translations as the student companies establish their quality assurance or quality control procedures.

Finally, cluster 3, in the lower left quadrant, includes the workflow tasks with low mention values both before (0–6) and after (1–8) the MTW. These less mentioned tasks are 4.1 General, 4.5 Handling of project-related client information, 4.6 Project preparation, 4.6.1.1 Project registration, 4.6.2.1 Technical resources, 4.6.3 Linguistic specification, 4.6.3.1 Source language content analysis, 4.6.3.3 Style guide, 5.1 General, 5.3.4 Review and 6.2 Closing administration. The group includes one quality assurance task, 5.3.4 Review, which is optional in the ISO 17100 standard, and one linguistic task, 4.6.3.1 Source language content analysis. For the most part, these tasks are administrative, and they may, e.g., include establishing a process for enquiries (4.1 General) or ensuring compliance with the client-TSP agreement (5.1 General). While these tasks associated with the role of an administrative project manager are crucial to the successful management of any translating organisation, they may seem secondary in the context of a simulated translation company, and the low task mention values for these tasks lay bare a need to refine some aspects of the MTW pedagogy.

Workflow task mentions in each of the clusters were calculated for each student to determine the individual students' workflow conception profiles and to track their change during the MTW. Grouping the students according to the number of mentions in each task cluster, it is possible to identify groups of students that have a different perspective on translation workflow. Based on the functions of the tasks in the translation process, two perspectives, or *workflow conception profiles,* were identified,

one of them with two sub-profiles. The profiles were named after the roles that the tasks in each cluster are most closely associated with in the translation process: 1) translation specialist, 2) project manager (execution) and project manager (administration). The groups are not mutually exclusive, and it is also possible that a student is not placed in any of these groups.

Using the cut-off points 75% for the translation specialist profile (cluster 1), 50% for the project manager (execution) profile (cluster 2) and 25% for the project manager (administration) profile (cluster 3), the students were grouped according to their workflow conception profiles (Table 3). The cut-off points were chosen based on two criteria: the theoretical maximum count for task mentions in the cluster (the higher the maximum count, the lower the cut-off point) and the distribution of students (the category must include at least 10% of the students). This choice of cut-off points is admittedly arbitrary, and in a sample with higher initial levels of project management competence they would have been higher, especially for the clusters 2 and 3. The relatively low cut-off points reflect the fact that the students in the MTW are only preparing for their careers in the translation industry and still have some time to develop their skills before they enter the job market.

[Please, insert Table 3 about here]

Firstly, there is a group of students who seem to focus mainly on the tasks in cluster 1, i.e. tasks that are relevant for a specialist role in the translation process, e.g., translator, reviser, reviewer, proofreader, terminologist. Secondly, there is a group of students who seem to look at translation workflow from a broader perspective and to be aware of the tasks in cluster 1 but also of the tasks in cluster 2, as well as of some of the

tasks in cluster 3. We suggest that these differences can be interpreted as two separate workflow conception profiles, the conception profile of a translation specialist (cluster 1) and the conception profile of a project manager (cluster 1 and the clusters 2 and 3). The task role translation specialist would seem to be familiar to the majority of the students already before the MTW, and at the end of the MTW, it is firmly established in all student conceptions. The tasks that belong to the responsibilities of a project manager are not familiar to the majority of the students before the MTW. However, at the end of the MTW, a number of students seem to be aware of most of the tasks connected with the execution of translation projects (cluster 2), and some students are aware of tasks that are connected with the administration of these projects (cluster 3).

It should be noted that cluster 1 includes two workflow tasks that are shared by both the translation specialist task profile and the project manager task profile, the tasks 5.2 Project management and 4.6.1.2 Project assignment. However, it is likely that these tasks are viewed differently by translation specialists and project managers: translation specialists will be in contact with project management and they will be assigned projects, but it is the project manager who takes care of handling these tasks.

A comparison of the profiles in Table 3 shows that all 20 students fulfilled the criteria for the Translation specialist profile at the end of the MTW, while 5 students did not fulfil the criteria before the MTW. At the end of the MTW, 12 students fulfilled the criteria for the project manager (execution) role, while only 2 students fulfilled these criteria before the MTW. Finally, at the end of the MTW, 8 students fulfilled the criteria for the project manager (administration) task role while 4 students fulfilled these criteria before the MTW.

Discussion and conclusion

It was our aim to answer the following research questions: 1) How does working in a simulated translation company learning environment affect translation students' workflow conceptions?, 2) What kind of workflow conception profiles emerge in a simulated translation company learning environment? As an answer to the first question, we observed a statistically significant increase in the number of workflow task mentions after a one-year-long translation company simulation course. This change was interpreted to reflect a transformation in the workflow concept within the student group. A quantitative comparison of pre- vs post-MTW data showed a progression in the overall workflow concept of the student group from an initial rudimentary concept with few workflow task mentions towards a more detailed concept that is closer to the translation industry concept represented by the ISO 17100. The change towards the industry concept was observed for all the workflow stages, the pre-production stage, production stage and post-production stage. The result can be seen as an indication that simulated translation company pedagogy may help to bridge the competence gap between academia and the translation industry.

To put these results into perspective, some methodological issues need to be addressed. Firstly, as the present study does not involve an experimental design or a control group, the changes in individual workflow conceptions cannot be interpreted as direct effects of the simulated translation company experience. For each student, there will have been several intervening variables influencing the workflow conception, and these variables were not accounted for in the current study design. On the group level, however, the results are likely to be robust enough to serve as indications that some degree of the conceptual change within the student group was due to the MTW experience.

Secondly, the study was based on the assumption that the students' essays reflect their workflow conceptions. However, the presentation of the individual workflow conceptions in the essays may be overly simplified as there was a recommended word count limit. With no follow-up to the essays, it was not possible to check if any aspects that were not included in the essays were known to the students. Despite this caveat, while the essays are not exact representations of how the students perceive translation workflow, the choices they made in presenting their understanding of workflow in the limited space are likely to reflect what they consider to be the essential aspects of translation workflow.

It is also possible that a content analysis with the ISO 17100 categories as the coding frame may not be capable of identifying natural categories in the students' mental representations of the translation workflow. A more qualitative analysis of the essays might have produced a different kind of representation of the students' thinking on translation workflow. However, as the express aim of the study was to compare the students' workflow conceptions to the categories of the industry consensus concept of workflow, a quantitative approach was used.

Finally, while it would have been possible to take into account the number of references to a specific coding category and to pay attention to the linear order of the references to different tasks within the essays, the analysis was restricted to merely counting the reference once for each essay. Using this coding principle, it is possible to state whether an essay does or does not reflect an awareness of a specific workflow task, but it is not possible to state with certainty whether the essay represents a coherent workflow conception with correctly placed task sequences.

Despite these methodological caveats, we believe that our quantitative approach to workflow conceptions produced some interesting results and opened some avenues for future studies.

Regarding the workflow conception profiles, a quantitative pre- vs post-MTW comparison of individual task mention values resulted in three clusters of workflow tasks that appear to reflect the duties of two different task roles, translation specialist and project manager, the latter with the two sub-roles executing and administrative. This result gave rise to the assumption, to be tested in future studies, that participation in the translation processes of a simulated translation company may lead to two kinds of workflow conception profiles, each with their core tasks. Our results indicate that after the MTW, all students could be associated with the translation specialist workflow conception profile. In addition to this specialist profile, a number of students developed another workflow conception profile that included tasks that are relevant in the work of a project manager. Among the students, there were differences in the degree of detail included in this project manager conception.

Based on our quantitative data, it is not possible to determine the relative positions of the two conception profiles: Are there two separate conceptions that live together in a student's conceptual ecology (Park 2007), or is there only one workflow conception that for some students is more detailed than for others? These are questions to be addressed in future studies. The answer to these questions may also shed some light to the question whether translation project manager competence is to be seen as different from translator competence, or if the distinction translation competence vs translator competence (Kiraly 2000) is already nuanced enough to separate 'actual translation work' (DGT 2016, 3) from the organisational tasks surrounding it.

Assuming that all participants had equal opportunities to learn about translation workflow during the MTW – as everyone was supposed to perform the task of project manager as well as other workflow tasks at least in one translation project, the results raise the question why some students would seem to stay with the translation specialist workflow conception profile while some students add to this profile the conception profile of the project manager. Whether the differences are based on internal factors, e.g., personality, motivation, talent, or whether they are the result of external factors, e.g., experiences in internships or other work experience not related to translation, is a matter of future studies. Taken together, our results show that even though translation teachers may sometimes have the impression that some students are 'born translators' while some may be 'born project managers', students' translation workflow conceptions may be considerably enriched in a simulated translation company environment. This suggests that with this type of pedagogical approach, 'born translators' can just as well become 'trained project managers'.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Table 1. Workflow task categories in the ISO 17100.

4 Pre-production processes and activities (no descriptor)
    4.1 General
    4.2 Enquiry and feasibility
    4.3 Quotation
    4.4 Client-TSP agreement
    4.5 Handling of project-related client information
    4.6 Project preparation
        4.6.1 Administrative activities (no descriptor)
            4.6.1.1 Project registration
            4.6.1.2 Project assignment
        4.6.2 Technical aspects of project preparation (no descriptor)
            4.6.2.1 Technical resources
            4.6.2.2 Pre-production activities
        4.6.3 Linguistic specification
            4.6.3.1 Source language content analysis
            4.6.3.2 Terminology work
            4.6.3.3 Style guide
5 Production processes (no descriptor)
    5.1 General
    5.2 Project management
    5.3 Translation process (no descriptor)
        5.3.1 Translation
        5.3.2 Check
        5.3.3 Revision
        5.3.4 Review
        5.3.5 Proofreading
        5.3.6 Final verification and release
6 Post-production processes (no descriptor)
    6.1 Feedback
    6.2 Closing administration

Note. The main stages are marked in bold. The categories that are not defined in the ISO 17100 standard are marked with 'no descriptor' in parentheses.

Table 2. Task mentions before and after the MTW. Aggregated sums for the main phases in bold.

Workflow task	Before the MTW	After the MTW	Difference
4 Pre-production processes and activities (aggregated)	**68**	**115**	**47**
4.1 General	2	8	6
4.2 Enquiry and feasibility	5	12	7
4.3 Quotation	5	11	6
4.4 Client-TSP agreement	5	13	8
4.5 Handling of project-related client information	5	4	-1
4.6 Project preparation	6	3	-3
4.6.1 Administrative activities			
4.6.1.1 Project registration	0	4	4
4.6.1.2 Project assignment	13	17	4
4.6.2 Technical aspects of project preparation			
4.6.2.1 Technical resources	4	7	3
4.6.2.2 Pre-production activities	7	15	8
4.6.3 Linguistic specification	0	1	1
4.6.3.1 Source language content analysis	1	1	0
4.6.3.2 Terminology work	14	19	5
4.6.3.3 Style guide	1	0	-1
5 Production processes (aggregated)	**82**	**109**	**27**
5.1 General	1	1	0
5.2 Project management	19	20	1
5.3 Translation process			
5.3.1 Translation	20	20	0
5.3.2 Check	1	12	11
5.3.3 Revision	14	20	6
5.3.4 Review	4	7	3
5.3.5 Proofreading	18	19	1
5.3.6 Final verification and release	5	10	5
6 Post-production processes (aggregated)	**9**	**18**	**9**
6.1 Feedback	7	11	4
6.2 Closing administration	2	7	5
Total (overall workflow concept)	**177**	**257**	**80**

Table 3. The number of students that fulfil the criteria of the workflow conception profiles.

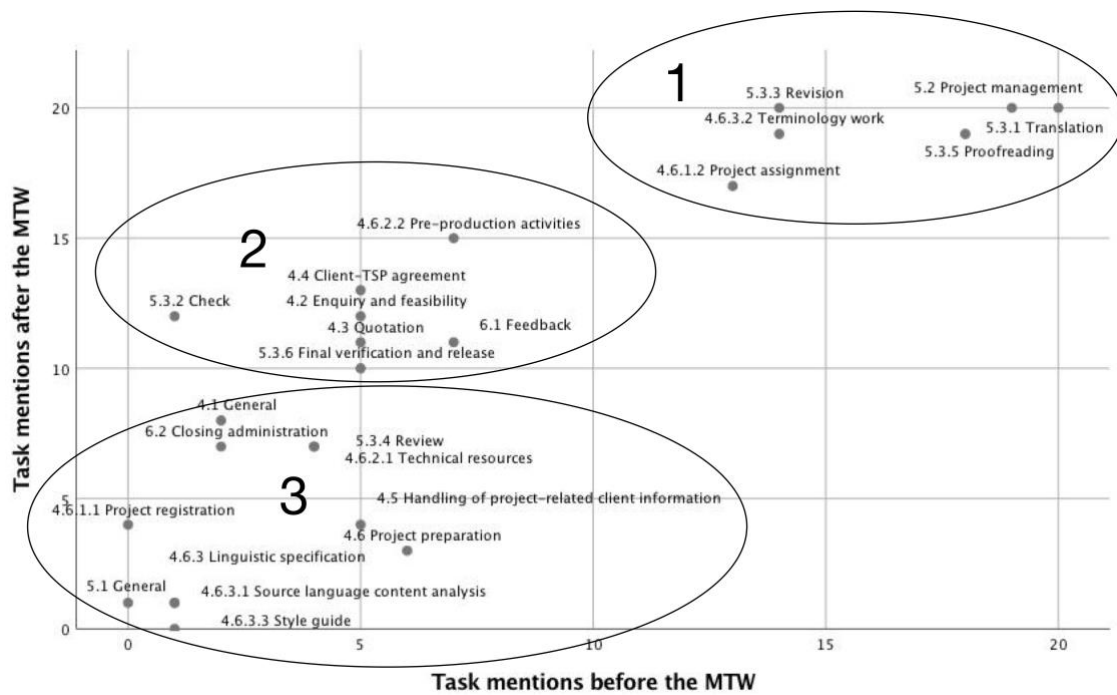| Point of time	Before the MTW	After the MTW
Translation specialist (> 75% of 6 group task mentions)	15	20
PM, execution (> 50% of 7 group task mentions)	2	12
PM, administration (> 25% of 11 group task mentions)	4	8

Figure 1. Workflow task clusters based on pre- and post-MTW mention values.