How Do Trainee Translators Mobilise Internal and External Support in L1 and L2 Translation Processes?*

W jaki sposób początkujący tłumacze korzystają z zasobów zewnętrznych i wewnętrznych podczas tłumaczenia na język obcy i rodzimy?

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Abstract. When solving translation problems, translators rely on internal and external sources of support, which is associated with the level of their translation competence and information literacy skills. This quantitative and qualitative multiple case study explores the types of support used by undergraduate translation students with stronger and weaker language skills before and after their first 7.5 months of translator education. The article examines the extent and success of use of internal and external resources in solving problems during L1 and L2 translation, as well as illustrating their diverse activation in sample translation processes. An analysis of data concerning the translation process and product for 315 problem-solving paths showed, among others, the importance of the activation of internal resources in addition to the use of external ones in providing high-quality translations, greater reliance on internal resources in L1 translation, greater success in relying on external resources to solve translation problems, and the complexity of the interplay between internal

and external resources. Pedagogical implications are formulated with regard to promoting the optimal use of both types of resources, with a particular focus on process-oriented pedagogy.

Abstrakt. W rozwiązywaniu problemów tłumaczeniowych tłumacze wykorzystują zasoby zewnętrzne i wewnętrzne, co jest powiązane z poziomem ich kompetencji tłumaczeniowej oraz informacyjnej. Niniejsze ilościowe i jakościowe studium wielu przypadków bada typy zasobów użytych przez studentów o wyższym i niższym poziomie umiejętności językowych w przekładzie pisemnym przed rozpoczęciem kształcenia w zakresie translatoryki i po 7,5 miesiącach jego trwania. W artykule oceniono zakres i skuteczność korzystania z zasobów zewnętrznych i wewnętrznych w rozwiązywaniu problemów w tłumaczeniu na język obcy i rodzimy, a także zilustrowano ich zróżnicowane użycie w przykładowych procesach tłumaczeniowych. Analiza danych dotyczących procesu i produktu tłumaczeniowego dla 315 ścieżek rozwiązywania problemów pokazała m.in. konieczność użycia zarówno wewnętrznych, jak i zewnętrznych zasobów w celu wykonania tłumaczenia wysokiej jakości, częstsze wykorzystywanie zasobów wewnętrznych w tłumaczeniu na język rodzimy, większą skuteczność rozwiązywania problemów tłumaczeniowych w oparciu o zasoby zewnętrzne oraz złożoność interakcji między zasobami wewnętrznymi i zewnętrznymi. Sformułowano wnioski dotyczące doskonalenia kształcenia tłumaczy w zakresie korzystania z obu typów zasobów, ze szczególnym uwzględnieniem dydaktyki zorientowanej na proces.

Słowa kluczowe: kształcenie tłumaczy, kompetencja tłumaczeniowa, korzystanie z zasobów zewnętrznych i wewnętrznych, kompetencja informacyjna, dydaktyka zorientowana na proces

1. INTRODUCTION

Translation has long been approached as a decision-making and problem-solving activity in its essence, with translators relying on two types of support. First of all, they mobilise their *bilingual*, *extra-linguistic*, *knowledge-about-translation*, and *strategic sub-competences*, in PACTE group's (2003) terminology. The better developed the translator's own cognitive resources and the more routine the task, the more likely it is that these will be relied on during the translation process and thus the translator will take advantage of *internal support* (Alves, 1997; as cited in Alves and Liparini Campos, 2009). If, however, internal resources are deemed insufficient for solving a given translation problem, the translator needs to make use of *external support* (Alves, 1997; as cited in Alves and Liparini Campos, 2009). This means conducting research and consulting various reference materials and tools, which requires the activation of information literacy skills or *instrumental sub-competence* (PACTE, 2003), with translators more recently increasingly benefitting from the use of electronic information sources, in particular web-based ones (Kuznik, 2017; Sycz-Opoń, 2019).

Research has shown that the adequate use of internal and external support is a feature of professional translation competence and successful translation

performance. Such were the findings of the PACTE (2009, 2017) study, whose first phase analysed the translation processes and products of professional translators ($n = 35$) and foreign language teachers ($n = 24$). The former used a combination of internal and external support and were more successful, particularly in L1 translation (translation into the mother tongue). In this type of translation, they tended to rely on predominantly internal support (PIS, consultation of external resources with the definitive solution not taken directly from bilingual sources), followed by (simple) internal support (IS, no consultation prior to the definitive solution being adopted). They thus had better developed and more effectively functioning instrumental and strategic sub-competences, and they additionally drew on a functional(ist) approach towards translation (see e.g. Nord, 1997; Reiss, 2000) in order to apply functional/dynamic solutions instead of the static ones found in external sources. In L2 translation (translation into a foreign language), where the quality of the translation solutions analysed was similar, both groups tended to utilise PIS, but they used predominantly external support (PES, consultation of different types of external resources, with the solution taken directly from bilingual sources) and simple external support (SES, consultation of bilingual resources from which the solution is adopted) more often than in L1 translation, compensating for less developed competence in the L2. Greater external resource use in L2 translation was found in other studies, not only among professionals (Whyatt et al., 2021; see Kuznik and Olalla-Soler, 2018) but also students (Pavlović, 2007; Sittirak and Na Ranong, 2023). In the case of language pairs including a language that has many native speakers, such as English, and a language of limited diffusion, the abundance of external resources in the former compared to those in the latter may also contribute to this tendency (Pavlović, 2007).

The simulated longitudinal study by PACTE (2020) contrasted the results obtained in simultaneous measurements from groups of first-fourth-year students and recent graduates ($n = 130$). This study found that PIS was used the most frequently by all groups except fourth-year students, and, in contrast to the results for professional translators, IS was used the least frequently, which indicated that the students avoided mobilising their cognitive resources. The students participating in PACTE's (2020) research tended to provide better-quality solutions when they applied external support more often, rather than when using PIS and in particular IS. According to the findings of a study by Binghan Zheng (2014), which used a modified version of PACTE's (2009) methodology, professional translators ($n = 6$) made significantly greater use of PIS than postgraduates ($n = 6$) and novices at the beginning of their translator education ($n = 6$) and smaller use of SES than the novices. Along the same lines, the Capturing Translation Processes project found that both professionals and MA students engaged their internal resources significantly more than first-year BA

students (Massey and Ehrensberger-Dow, 2014; $n = 11$, 8, and 15, respectively), and the TransComp project delivered similar results for professionals vs. first-semester BA students, the students being considerably less successful when using external support (Prassl, 2010; $n = 10$ and 12, respectively). According to the findings of multiple process studies, professional translators are ready to activate their world knowledge and make inferences about the text (type) and treat them as a basis for translation decisions, whereas students often rely on the authority of (typically bilingual) dictionaries over their own judgment (e.g. Barbosa and Neiva, 2003; Kussmaul, 1995; Kussmaul and Tirkkonen-Condit, 1995; Sycz-Opoń, 2019; see also Onishi and Yamada, 2020). In addition, the former perform deep searches in order to comprehend the content of the source text (ST) and avoid mistranslation. They acquire the necessary background knowledge and make sure that the information found is reliable, sometimes resorting to the use of multiple sources of information, which allows them to translate "holistically," rather than word by word, as students tend to do (Onishi and Yamada, 2020, p. 21; see also Enríquez Raído, 2014; Gough, 2024; Kuznik and Olalla-Soler, 2018; Sycz-Opoń, 2019). One of the reasons why students do not make extensive use of their internal resources is that their translation competence is still developing and they may mistrust it, especially when translating specialised texts (Sycz-Opoń, 2019). They do not have established routines, which would help them make decisions more easily, based on IS; they tend to allocate substantial cognitive resources to making decisions concerning small translation units and fail to consider several criteria that are key for producing acceptable translations (Göpferich, 2011; Prassl, 2010). The latter issue is related to the fact that students are still acquiring a functionalist approach to translation and learning how to establish a macro-strategy before starting to translate the text, which should govern local micro-level translation decisions (e.g. Englund Dimitrova, 2005). At the same time, however, since students' instrumental sub-competence is underdeveloped, they may exhibit the opposite tendency – that of overusing internal support, achieving poor results. This was the case, among others, with teachers and some groups of students in the research by PACTE (Kuznik, 2017; Kuznik and Olalla--Soler, 2018; PACTE, 2009, 2017, 2020) and the students in the research of Sha Lu et al. (2022), which showed that online information seeking behaviour was positively correlated with translation performance. Simultaneously, multiple case studies have revealed significant variation in external resource use of both translation professionals (Gough, 2019, 2024) and students (Sycz-Opoń, 2019; see also Paradowska, 2021), including preferences independent of directionality (Pavlović, 2007).

Since research investigating the individual patterns of students' use of external and internal support is still limited, I have carried out a multiple case study that attempts to fill this gap. The study, which is presented in the following sections, examines the extent and success of the use of internal and external support types in

solving problems during the translation process depending on directionality, as well as illustrating the diverse activation of internal and external resources in samples of the participants' processes. It investigates both L1 and L2 translation, since – as with other languages of limited diffusion – in the case of Polish, bidirectional translation is a reality of the market (Whyatt and Kościuczuk, 2013). The study involved students with both stronger and weaker foreign language skills, reflecting the mixed language competence levels of translation students studying at the department where the study was conducted.

2. METHODOLOGY

This section describes the methodology of the study, including its participants and setting as well as the methods of data collection and analysis. Data related to the translation processes and products were collected before the students' translator education began and after 7.5 months of the educational intervention.

2.1. Participant selection and setting

The participants ($n = 8$) were second-year students of an undergraduate programme in Applied Linguistics at Maria Curie-Skłodowska University in Poland. All of them specialised in translation. They were recruited to two subgroups – with higher (participants A–D) and weaker (participants E–H) foreign language skills – based on their results in the English skills exam taken at the end of the first year of their studies. The students selected for the study had no previous experience whatsoever in translation. Their translator education began in the second year, when they attended a lecture in translation theory, completed a simulated translation practice, and took courses in sight translation and the "fundamentals of translation." The latter was a one-semester-long practical course in non-specialised translation aimed at helping students develop the three translation-specific sub-competences of translation competence according to the PACTE (2003) model. The course focused in particular on teaching students how to proceed strategically, based on a functionalist approach towards translation. The students learnt how to analyse the elements of the translation situation (translation brief), formulate a suitable macro-strategy, adopt adequate micro-strategies, and evaluate alternative translation solutions, as well as how to communicate with the client and make effective use of reliable external resources. The latter aspect was referred to when the students' translations were discussed in the classroom, but it was not recorded, reported on, or evaluated in any of the assignments. In addition, a session related to using online sources of

information and tools (including collocations and other monolingual dictionaries, monolingual corpora, parallel texts, discussion fora for translation professionals, and advanced search operators) and designing glossaries was organised. The course had been completed before the second measurement took place.

2.2. Data collection

The study used a combination of product- and process-oriented methods and instruments of data collection, including adaptations of those applied in the PACTE (2009) and TransComp (Göpferich, 2010) studies. Test 1 was performed before the students' translator education began, and test 2 was conducted 7.5 months later. The STs were two consumer-oriented, non-specialised texts (an English and Polish text), which were comparable in terms of readability (Gunning-Fog index) and lexical variety (type-token ratio). The English text was a review of a documentary on obesity, originally published on the website of The Guardian, that was to be used in an advertisement targeted at its potential Polish viewers. The Polish text was an announcement about the "Teacher of the Year" contest for Polish teachers that was to be sent to the headmasters of British schools. The same texts were translated in both tests. The core elements of the procedure were as follows. The participants began by translating the first ST, using any online resources they wished as well as any other sources that they had declared they routinely used when working with English (these had been provided for them in electronic form). The translation process was screen-recorded (Camtasia Studio) and tracked using key logging software (Translog). Next, the participants completed a retrospective questionnaire concerning the priorities they had had when translating the text (i.e. the macro-strategy) and the greatest problems they had experienced when translating it (an adapted version of PACTE's questionnaire; Hurtado Albir, 2017). They then performed cue-based retrospective verbalisation. The participants' on-screen activity while translating was replayed to them with double speed, and they were asked to describe how they proceeded step by step and dealt with any problems or difficulties experienced, and to say what they were thinking at that moment. The procedure was then repeated for the second ST.

2.3. Data analysis

Verbal and non-verbal data were analysed for *Prominent Attention Units* (based on Jääskeläinen's [1993] *attention units*), or PAUs, which were defined as "segments in the source texts that the participants devoted most of their attention to in the study […] and that triggered effortful, conscious, and/or goal-oriented (or strategic) behaviour, aimed at making decisions or solving problems" (Chodkiewicz, 2020,

p. 142; cf. Jääskeläinen, 1993; Lörscher, 1991). They were identified using several primary and secondary indicators, mostly based on those applied in the TransComp project (Göpferich, 2010). Selected PAUs were tagged as *Rich Points* (cf. PACTE, 2003) representing objective and inter-subjective translation problems. Twenty--four Rich Points (12 for each language direction), representing different types of prototypical translation problems, were tentatively selected pre-assessment and verified post-assessment. The problems fell into three categories: (a) encyclopaedic, cultural, and/or translation reader- and brief-related problems (2 in L1 and 6 in L2 translation); (b) re-expression problems related to ST deficiencies or contrastive language features (potentially causing language correctness and coherence issues in the target text, TT; 4 in L1 and 3 in L2 translation); and (c) re-expression and potential comprehension problems (possibly resulting in issues with meaning in the TT; 6 in L1 and 3 in L2 translation).

For the purpose of the current study, the decision-making process for each PAU was coded for source of support as follows, based on the categorisation designed by PACTE (considering the principle that if a consultation was made after the definitive solution was offered, it was not considered a consultation in the categorisation process as such, as it was made for confirmation purposes):

(1) Internal Support (IS) – the definitive solution is based exclusively on internal support, with no consultation prior to it being adopted […];

(2) Predominantly Internal Support (PIS) – the definitive solution is based predominantly on internal support, i.e. any combination of consultations that does *not* include consultations of bilingual resources from which a solution is adopted in the translation […];

(3) Predominantly External Support (PES) – the definitive solution is based on external support, i.e. any combination of consultations that includes consultations of bilingual resources from which a solution is adopted in the translation […];

(4) Simple External Support (SES) – the definitive solution is based exclusively on consultation of bilingual resources from which a solution is adopted in the translation […] (2020, pp. 168–169, emphasis added).

Translation quality was assessed using a specially designed error-based system considering error type and severity, mostly based on those implemented in the TransComp study (Göpferich, 2010), by the American Translators Association, ATA (Koby and Champe, 2013), and by the Institute of Translation and Interpreting, ITI (2014). Two measures of translation quality were used in the current study. The first one was the total score for translation quality, which was calculated by subtracting the total error severity scores from 100 points. The results were classified as high, moderate, very low, and low. The second one was the assessment of the

acceptability of the definitive solutions delivered for the PAU segments according to whether the solution was acceptable (no errors), semi-acceptable (0.5-point error), or non-acceptable (errors amounting to 1 point or more) (a system inspired by Göpferich, 2011; PACTE, 2009). This assessment made it possible to determine how successful the participants' use of particular types of support was.

Based on the numerical values that were observed regarding the main topic covered in this article, the participants were given descriptive labels in an attempt to "taxonomise" the diversity of their reliance on internal and external support (Gough, 2024, p. 398; see also Sycz-Opoń, 2021). Depending on the extent of the use of internal vs. external resources in providing the final solution, the participants were categorised into three types of users: self-reliant (preferring types of support where the final solution is based on internal resources), source-reliant (preferring types of support where the final solution is based on external resources), or mixed (not having a clear preference for internal or external sources of support in delivering the final solution, the difference between IS+PIS and PES+SES amounting to 16% or less).

3. RESULTS AND DISCUSSION

This section discusses the results of the study, first looking at the profiles of individual students and then at sample problem-solving paths illustrating the diverse interaction of internal and external resources in the translation process and giving examples of more and less successful behaviour. For an explanation of the acronyms used for different types of support, see Section 2.3.

Table 1 presents the profiles of individual participants in the form of a summary of qualitative and quantitative information regarding the quality of the translation products and the participants' extent and success of reliance on different types of support.

The following general observations can be made based on an analysis of the participants' profiles:

1. High translation quality (delivered only by students with stronger language skills, i.e. A and B in both tests and C in test 2) was never achieved by means of source-reliant behaviour. It was always connected with either self-reliance or the mixed use of internal and external sources, which highlights the primordial importance of the (successful) activation of translators' internal resources. Students with stronger language skills generally tended to rely more on internal sources of support than did weaker ones, but variation was found within subgroups. For example, in L1 translation in test 1, student G, who had weaker language skills and produced TTs of very low quality,

Table 1. Individual subject profiles based on translation product quality and the extent and success of use of different types of support in solving individual translation problems in tests 1 and 2

Test	Lg direction	Translation product quality (score in brackets)	Classification according to preferred support types	Type of support (%)				Acceptability of translation solutions (mean score)			
				IS	PIS	PES	SES	IS	PIS	PES	SES
			Participant A								
1	L1	High (75.0)	Self-reliant	29	42*	13	17	0.6	0.6	0.7	0.6
	L2	High (75.0)	Mixed	34	17	31**	17	0.6	0.6	0.8	0.6
2	L1	High (78.5)	Self-reliant	40	50*	5	5	0.6	0.7	0.5	1.0*
	L2	High (83.0)	Mixed	30	19	30**	22**	0.6	1.0**	0.9**	0.8
			Participant B								
1	L1	High (64.5)	Self-reliant	32	50*	9	9	0.4	0.7	1.0*	1.0*
	L2	High (71.0)	Self-reliant	28	36	25**	11	0.6**	0.6	0.7	0.5
2	L1	High (73.5)	Self-reliant	71*	29	0	0	0.9	0.7	n/a	n/a
	L2	High (73.5)	Self-reliant	56	36	8	0	0.9	0.7	0.5	n/a
			Participant C								
1	L1	Moderate (54.0)	Self-reliant	55*	21*	14	10	0.4	0.6	0.8*	0.5
	L2	Moderate (59.5)	Source-reliant	23	0	29**	49**	0.6**	n/a	0.3	0.6
2	L1	High (72.5)	Self-reliant	52*	43*	4	0	0.5	0.6*	1.0	n/a
	L2	High (84.5)	Mixed	29	23	19**	29**	0.6	0.4	1.0	1.0
			Participant D								
1	L1	Moderate (50.5)	Mixed	35	22*	4	39	0.2	0.6*	0.0	0.6
	L2	Moderate (44.0)	Mixed	37	7	7	50	0.5**	0.0	0.5**	0.6
2	L1	Moderate (59.5)	Mixed	7	48*	11	33	0.5	0.4	0.7	0.7
	L2	Moderate (51.0)	Source-reliant	14	5	19	62**	0.4	0.8**	0.6	0.6
			Participant E								
1	L1	Moderate (49.5)	Mixed	13	41*	21	26	0.8*	0.4	0.6	0.7*
	L2	Moderate (45.5)	Source-reliant	18	16	47**	18	0.2	0.3	0.6	0.4
2	L1	Moderate (56.0)	Self-reliant	20	48*	24	8	0.4	0.5	0.7	0.5
	L2	Moderate (51.0)	Mixed	19	27	30	24**	0.4	0.6	0.7	0.4
			Participant F								
1	L1	Very low (8.5)	Mixed	5	46*	19	30	0.0	0.4	0.4	0.5
	L2	Very low (20.5)	Source-reliant	9	13	21	57**	0.4**	0.7**	0.3	0.5
2	L1	Moderate (53.5)	Self-reliant	21*	52*	15	12	1.0*	0.5	0.7	0.5
	L2	Moderate (59.0)	Source-reliant	4	10	33**	53**	0.5	0.7**	0.6	0.7**
			Participant G								
1	L1	Very low (14.5)	Self-reliant	25	75*	0	0	0.0	0.4	n/a	n/a
	L2	Very low (-0.5)	Self-reliant	52**	32	16**	0	0.3	0.3	0.4	n/a
2	L1	Very low (31.0)	Self-reliant	25	46*	13	17	0.7*	0.4	0.2	0.9*
	L2	Moderate (58.5)	Source-reliant	26	11	15	48**	0.4	0.5	0.4**	0.7
			Participant H								
1	L1	Very low (0.5)	Source-reliant	15	23*	30	33	0.4	0.2	0.3	0.5
	L2	Very low (3.0)	Source-reliant	7	7	35	50**	0.5	0.3	0.2	0.5
2	L1	Very low (22.0)	Mixed	16	42*	19	23	0.3	0.3	0.5	0.7
	L2	Low (41.0)	Mixed	33**	19	33	15	0.5**	0.6**	0.6	0.6

L1 = L1 translation, L2 = L2 translation. Shading in fourth column indicates difference in support reliance between L1 and L2 translation. In the following columns, bold font indicates highest values observed for a given participant in a particular test; *indicates higher value for L1 translation; **indicates higher value for L2 translation.

Source: Unpublished data collected by the author.

did not draw on external resources at all, in contrast to other students in this subgroup.

2. With respect to directionality, the students always relied more on types of support that were more heavily based on internal resources (IS+PIS) than on external resources (PES+SES) when translating into the L1 than the L2 (though sometimes the difference was minimal, which is why the participants' qualitative classification differed for the two language directions in 10 out of 16 cases). This was likely related not only to increased self-confidence when performing L1 translation due to higher language competence and more reliable language intuition (e.g. Kuznik and Olalla-Soller, 2018) but also to the different nature of the problems posed by the two tasks. These differences were partly due to the specificity of L1 and L2 translation. In L1 translation, students had more comprehension problems and fewer production problems, and the reverse was true for L2 translation. In addition, in this particular situation, the L1 translation task posed, among others, more re-expression problems involving comprehension issues where external resources were potentially less useful and more difficult to apply than was the case with L2 translation.[1] Looking at particular types of support, student G used more IS in T1 and H applied more IS in T2 in L2 translation than in L1 translation, but the participants achieved very low or low translation quality (respectively).

3. Regardless of the quality of the translations delivered, in 20 out of 32 cases, participants produced more acceptable solutions when relying on external--resource-based support (PES+SES). Some of the most notable exceptions were B, C, and F in L2 translation in test 1 as well as F in L1 translation in test 2, who were more successful in relying on internal-resource-based support (IS+PIS). This is in line with the findings of the PACTE (2020) study, where student acceptability scores were generally higher when they drew on external resources to a greater extent (apart from initial measurements). The results for individual students showed that this was also true for the most successful translators, who, despite relying primarily on IS and PIS, were generally unable to provide more acceptable results than was the case with SES and PES. These results may indicate the underdevelopment of the participants' internal resources.

The following paragraphs discuss selected steps from the problem-solving paths for two problems which belonged to the category of encyclopaedic, cultural,

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[1] In L1 translation, external resources can be expected to be drawn on more to construct meaning, and internal resources tend to be applied to a greater extent in TT production, whereas the opposite tendency is found in L2 translation (Whyatt et al., 2021).

and/or translation reader- and brief-related problems (Rich Points), one in L1 and one in L2 translation (see Appendix).

The problem in L1 translation is translating "a Kia-Ora" (Table 2 in Appendix) which is used in the following fragment: "Scientists explained that the fructose in corn syrup could play havoc with the appetite. It suppressed the hormone leptin, which in former days would be telling the brains of cinemagoers to go easy after a Kia-Ora and a packet of Spangles." It is unlikely that the participants had ever heard of the two alimentary products mentioned in the ST but with high L2 competence and careful consideration of the context, it was possible to deduce that they contained fructose (rather than sugar, which triggers the release of leptin), were consumed in cinemas, and were sold (mostly) in the past. Even if the students had potentially been able to deduce this drawing on their internal resources, they were still likely to need confirmation and/or more background information in order to provide a translation that would fulfil the intended function for the TT reader. In the study, PIS was most frequently used to solve this problem. This was true for all participants that provided acceptable solutions (either using a drink of a brand known in Poland or providing a descriptive translation), all of whom had stronger language skills (A-2, B-2, C-1, C-2, and D-2). An in-depth analysis shows that these successful translators made good use of contextual cues to activate the pertinent meaning (understood the ST well) and considered the needs of the TT reader in the new communicative situation, which, as is worth adding, was in line with their functional/dynamic macro-strategies declared in the retrospective questionnaire. Aware of the nature of the problem and of their resulting information needs, they were able to use external resources strategically to acquire extra-linguistic knowledge about the beverage, evaluate the search results adequately, and provide a functional translation. Such successful extra-linguistic searches were also performed by students who provided non-acceptable solutions with minor errors, adding words such as "bottle" or "drink" to precede "Kia-Ora" (A-1 and B-1, both with functional macro-strategies), though only A-1 verbalised her concern regarding the reader understanding the text and her awareness that similar Polish products could have been used. Extra-linguistic information with regard to what Kia-Ora is and whether it is still sold abroad or in Poland was mostly acquired via Wikipedia, Google Images, the website of its manufacturer, but also a discussion forum, an advanced Google search restricted to Polish websites, and a monolingual dictionary with information on the type of beverage that it is (squash). In many cases, though, the problem-solving process was unsuccessful, as students with weaker language skills clearly did not process the context correctly (e.g. E-1and H-1). This led to their completely non-strategic of external resources, such as bilingual dictionaries, and resulted in critical mistranslations in the definitive solution

(E-1) or provisional solution (H-1). E-1's process is also an example of repetitive non-strategic searches in the same resource type and even the exact same source despite obtaining irrelevant results. These unsuccessful students were guided by static macro-strategies. Reliance on internal support in the case of this translation problem led only to a non-acceptable solution in the case of D-1. Her case also illustrates the non-use of external resources despite a clear lack of knowledge about the products and uncertainty regarding the adequacy of the TT version, which is not in line with her declared dynamic/functional macro-strategy.

The problem in L2 translation shown in Table 3 in the Appendix is "*na szóstkę z plusem*," which occurs in the excerpt "*najlepsi z najlepszych, wyjątkowi nauczyciele na szóstkę z plusem*." The phrase can be translated as "A+," "extraordinary," or "exceptional," and the entire excerpt can be translated into English, for example, as "the best of the best, exceptional A+ teachers" or simply "A+ teachers" or "extraordinary teachers." This example illustrates the individual variation in the support type used to solve a particular problem and successfully so. Moreover, the problem-solving process illustrates the tendency of weaker students to rely more on external resources in deciding on the final solution. All stronger students, with the exception of D-2, drew on IS or PIS, whereas weaker students mainly relied on PES (6 cases; a case of a weaker students' unsuccessful use of IS exemplified by G-2's process). This example also illustrates minor or major inefficiencies in external resource use (A-2 and H-1, respectively) and the non-strategic choice of external resources (B-1 and H-1) found in the study. H-1's process in particular exemplifies a persistent hunt for an equivalent from a bilingual dictionary that could be copied and pasted in the translation. Although a potentially useful translation was displayed for another grade (D plus), she was unable to use her internal resources to take advantage of this search result. D-2 also relied heavily on bilingual resources. Despite applying an acceptable solution, partially based on results from Google Translate, she then changed it to another solution, copying the search results more faithfully.

In summary, the process data shows that a successful translation process involves the effective use of contextual cues to activate the pertinent meaning and consideration of the needs of the TT reader in the new communicative situation; the strategic use of external resources (which requires identifying one's information needs and planning the search correctly as well as evaluating the search results); and providing an adequate translation that meets all the necessary criteria. In a professional translation scenario, all this should be additionally carried out in an efficient manner. The study has shown that all the above-mentioned areas can be problematic for translation students, as observed also by other authors (Enríquez Raído, 2014; Massey and Ehrensberger-Dow, 2011; Olalla-Soler, 2018; Sycz-Opoń, 2019).

4. CONCLUSIONS AND PEDAGOGICAL IMPLICATIONS

The analysis of the data collected in the current multiple-case study has led to the following observations, contributing to the existing body of research on the use of internal and external resources by trainee translators.

1. High-quality translations, produced by students with stronger language skills, were connected with either self-reliance or mixed use of internal and external types of support, highlighting the primordial importance of the successful activation of students' internal resources (in addition to the use of external resources).
2. The participants generally took advantage of their own cognitive resources more during the L1 than the L2 translation task.
3. On the whole, students were more successful (i.e. produced more acceptable solutions) in relying on external support types than on internal ones.
4. The students had varied levels of success in the activation of internal and external resources in solving translation problems. This is a complex, multi--faceted process, in which several requirements need to be met if an ad-equate solution is to be provided. At the same time, acceptable solutions for the same translation problem can often be reached using various types of support.

The study has several pedagogical implications, which may be applicable in different translator education contexts. Since this and previous studies have found that students tend to require the use of external resources more than professionals in order to provide acceptable translations, this is an element that needs to be trained extensively. The participants of the current study only received limited training in the use of external resources in order to help them successfully solve translation problems. Much more intensive training should be offered, especially that students' use of external resources was far from optimal. The participants also had problems with activating their internal resources, which are more difficult for the students to develop and rely upon, especially if their L2 competence is not at the highest level and they have little thematic and terminological knowledge about a given subject. Pertinent sub-competences (i.e. the bilingual and extra-linguistic sub-competences in PACTE's [2003] terminology) can be developed to a certain extent as part of translation programmes, especially when systematic language training and specialised translation courses are offered. However, what seems to serve as a basis for the operation of internal support, especially in the initial stages of translator education, is the knowledge about translation and strategic sub-competences. It is acquiring these sub-competences that helps students: (1) adopt a functional view of translation, which is function-, meaning-, and reader-oriented, rather than a static

one; (2) analyse key intra-textual and extra-textual factors with relation to the ST and prospective TT; (3) formulate an adequate macro-strategy; (4) recognise the nature of translation problems (which in the beginning, students often perceive as purely linguistic); (5) apply appropriate micro-strategies that are in line with the macro-strategy; (6) evaluate possible translation solutions and choose the one that meets all the necessary criteria; and (7) monitor the TT with respect to errors.

Though many translation programmes feature courses dedicated specifically to the use of external resources in translation, I would argue that internal and external resources should be developed simultaneously, alongside each other in order to promote their effective interaction. This can be done by means of process-oriented translator training applied in the context of simulated, near-authentic translation assignments (cf. Gough, 2019). Translation processes (whether individual or collaborative) can be tracked using notes and commentaries, questionnaires, voice-recording, screen-recording, and even eye-tracking, making it possible to analyse the steps taken in the translation process and the emerging patterns. This encourages more (self-)reflection and makes it possible for students to receive contextualised feedback from the teacher and peers, leading to much more effective development of translation competence. Finally, in light of the diversity found among students, some of whom seemed to make inadequate and excessive use some types of support, there is a clear need for taking a personalised approach, which makes it possible to individualise translator training (see also Gough, 2019; Sycz-Opoń, 2021). In its current version, the "fundamentals of translation course" (which is now two semesters long) is process-oriented, meaning that each translation task (whether individual or collaborative) involves reporting on and/or analysing the translation process, i.e. the macro-strategy and the process of solving the greatest translation problems encountered. The students have an opportunity to analyse and improve collaborative translation products and processes (their own and those of other students), as well as reflecting on the sources of their errors and ways to enhance their translation competence/performance in the future. In fact, the Polish text used in the study has been applied in a product- and process-oriented mock assignment, where detailed process data were evaluated (and commented on) by the teacher according to the methodology used in the current study. This made it possible for students to receive feedback on the strategicness of the use of internal and external resources, the acceptability rates for the use of particular support types, and patterns of overreliance on internal or external resources.

Despite the contributions of the study, it has some important limitations, which restrict the generalisability of its results. First of all, it was limited to a very small sample of students from one institution translating in one language pair. Secondly, the same texts were used in both tests, which means that the results in test 2 are partly attributable to a learning effect. Thirdly, the STs selected for the study posed

somewhat different problems to the students, though this was to some extent due to the specificity of L1 vs. L2 translation. The findings may not be applicable to specialised translation, which may require much thematic knowledge regardless of directionality. Fourthly, the study drew on self-report data, collected in retrospective verbalisation and a retrospective questionnaire; however, their potential disadvantages were offset by triangulating them with data obtained using objective methods and by using cues to stimulate the participants' memory in the verbalisation. Finally, the study has not systematically analysed several other potentially important features of translators' use of external resources, such as the diversity of monolingual and bilingual types of resources/specific resources used or expert web search behaviour, which are worth exploring in the future.

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APPENDIX

Table 2. Selected steps from participants' problem-solving processes for "Kia-Ora"

PIS					IS
Acceptable solutions	Non-acceptable solutions				
Adaptation or descriptive translation	Minor error (-1 point) (adding the word "bottle" or "drinks")		Major error (copying ST name)	Critical error ("a greeting")	Major error (copying ST name)
A-2, B-2, C-1, C-2, D-2	A-1	B-1	H-1	E-1	D-1
Internal resource use-related steps					
Considers that products are unknown to Polish readers and that similar products (which have the same associations) familiar to them should be used in TT (+)	Considers that products are unknown to Polish readers and brand name is not enough to understand TT (+) Is aware that it could have been replaced with Polish equivalent (+)	n/d	n/d	*Does not know how this part of the sentence is related to the rest of it (0)*	n/d *(Is uncertain if she has translated names correctly and does not know what the products are)* *see below*
External resource use-related steps					
(All participants) LU Kia-Ora in source such as: - Wikipedia - Google Image search - and/or Coca-Cola page with Kia-Ora information (+) A-2: LU *squash* in Longman Dictionary of Contemporary English (MD) A-2: Uses Yahoo! Answers discussion forum (entry: Do they still make 'kia-ora' orange juice?) (A-2) (+) A-2: Looks for Polish sites concerning product: googles *kia-ora site:.pl* (+)	LU Kia-Ora in Wikipedia (+)		LU *kia-ora* in Diki (BD) (KIA = killed in action) (−) Uses a translation of phrase (−) Looking at *packet of Spangles*, she deduces that *Kia-Ora* is food or drink and LU *kia-ora* in Google Images (+)	LU *Kia ora* in Collins English Dictionary (MD) (irrelevant result – *Maori greeting*) (0) LU *Kia ora* in PONS (BD; no relevant results) (−) LU *Kia ora* in Megaslownik (BD; with no results) (−) Leaves question marks, skips phrase (0) Return to problem : LU *kia ora* in Longman Dictionary of Contemporary English (MD) LU *kia ora* in Dict.pl (BD) (−) LU *kia ora* in Collins English Dictionary (MD) again (= greetings) (−)	None *(Does not consult any external sources although she does not know what the product is)*

LU = Looks up. BD = bilingual dictionary, MD = monolingual dictionary. Steps were assessed as strategic (+), neutral (0), or non-strategic (−) according to the level of goal-directedness and efficiency of the interaction (see Chodkiewicz, 2020).

Source: Unpublished data collected by the author.

Table 3. Selected steps from participants' problem-solving processes for "*na szóstkę z plusem*"

IS		PIS		PES		SES
Acceptable solution ("A+ [teachers]")	Non-acceptable solution: critical error ("for six with plus")	Acceptable solution ("A+ teachers")	Non-acceptable solution: major error ("those are undeniably special teachers")	Accept-able solution ("who deserve[s] the best grade")	Non-acceptable solution: critical error ("for the grade six with plus")	Acceptable solution ("the best of the best, exceptional [teachers]")
C-1	G-2	A-2	B-1	E-1	H-1	D-2
Internal resource use-related steps						
Reflects on differences in grading system in Polish and British schools (+)	Decides to translate phrase literally despite having doubts (−)	Thinks TT reader will not be able to understand literal translation (+)	Wants to translate phrase so that it sounds natural and not literally (+) *(see below)*	Is aware that there is different grading system in UK and using literal translation does not make sense (+)	*see below*	*see below*
External resource use-related steps						
None	None	Performs 3 searches in Google with no relevant results (0) (*na szóstkę z plusem*; *"na szóstkę z plusem," "na szóstkę z plusem" English"*) Googles *"na szóstkę z plusem" angielski*, which is very similar to previous search (−) Googles *A+ student* because she knows that this phrase exists (0) Googles *A+ teacher* (+)	LU *na szóstkę z plusem* in Proz.com term search with no results (−) LU *szóstka z plusem* in Proz.com term search, no results (−)	LU *zasłużyć* in PONS (BD) (= deserve) (+) LU *deserve* in Collins English Dictionary (MD) (0)	LU *na szóstkę* in Diki (BD) (0) LU *z plusem* in Diki (BD) (dopuszczający plus = D plus) (+) Googles *na szóstkę z plusem in english* and clicks on irrelevant advertisement (−) LU *plus* in Diki (BD), despite already conducting similar and more targeted search (−) LU *six* in Diki (= sześć) (=) LU *na dwójkę* in Diki, despite fact that such results have already been delivered (−) *Decides to use calque as she has not found satisfactory translation* (−)	LU *najlepsi z najlepszych, wyjątkowi nauczyciele na szóstkę z plusem* in Google Translate (= *the best of the best exceptional teachers on six of plus*, then *at six of the plus*) (0) *Decides to omit phrase and use synonym, because literal translation would not make sense* (+) Writes acceptable provisional translation, which she later changes (*the best of the best teachers*) (−) Writes acceptable final solution closely following Google Translate suggestion (+)

LU = Looks up. BD = bilingual dictionary, MD = monolingual dictionary. Steps were assessed as strategic (+), neutral (0), or non-strategic (−) according to the level of goal-directedness and efficiency of the interaction (see Chodkiewicz, 2020).

Source: Unpublished data collected by the author