# Generic Competences and Earnings for Health Graduates

**By**

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## Abstract

*Generic competences are becoming increasingly important in this era of globalised knowledge economy development in which specific competences are changing rapidly with change of technology. The researcher used data set developed by Reflex Project – a project funded by European Union. The study explores the relationship of generic competences with income of health graduates. On the basis of health graduates' assessment of the competences the study investigated into the nineteen given competences for both acquired as well as required levels, as the determinants of monthly income of health graduates through ordered-probit-analysis. The study concludes that the health graduates with higher levels of generic competences have more earnings than their counterparts with comparatively lower levels of generic competences. We found economic benefit for health graduates with higher level of generic competences. We conclude that it is important to incorporate generic competences in the ePortfolio of health graduates.*

**Keywords:** *Generic competence, healthcare, Income, ePortfolio, labour market*

## 1. Background

An electronic or digital portfolio, also known as a webfolio or ePortfolio, is becoming increasingly important in the information society of 21st century which heavily relies upon information technology. "In recent years, the internationalization of economic life is being reflected more and more in the internationalization of education", said Heijke and Meng (2006). ePortfolio plays imperative role through the various stages of education and employments and even into retirement of the health graduates of today's modern society. Health graduates are those individuals who have successfully completed their professional bachelor degree which allows them access to be health professionals like physicians, surgeons etc.

We know that paper portfolio was in use long before the inception of ePortfolio. However, the later has certain advantages over the former. The most conspicuous gain of ePortfolio is that that it is much more cost effective as compared to its paper counterpart. Portability and manageability are two other merits of it. Results of a comparative research, by van Wesel and Prop (2008), between paper based portfolios and electronic portfolios in the same setting, suggest the preferred use of an ePortfolio which leads to better learning outcomes. This is perceptible through, for example, *LinkedIn* and *europass* which are making excellent use of ePortfolio.

For successful functioning and development, Nijhof (1998) regarded the labour market relevant knowledge and skills as well as a set of personal competences as crucial. In fact, ePortfolio is an expression of the individual's competences. It supports lifelong learning as it can be enthusiastically maintained over time. There is a debate over the ascendancy of specific over the generic competences, or the inverse of it. A good number of researchers (for example: Campbell and Laughlin, 1991; and Mane, 1998) are inclined to merit specific competences more than the generic competences for employability in

the labour market. However, Teichler (1999) appears to be strict in his conviction that discipline specific knowledge is rendered obsolete at an increasing rate by the pace of technological progress; hence the generic competences are more important in the world of work (Bowen, 1977; Stasz, 1998). Amidst these (apparently) antithetic point-of-views, which are based on empirical findings, regressive opinion characterizes the flexible graduates to be equipped of necessary and sufficient (level of) specific competences along with the repertoire of generic competences, of international breadth, in their ePortfolio. Heijke et al. (2003) discovered that generic competences (having indirect monetary value rather than the direct one) are used by on-the-job training to adjust the required level of specific competences. Being more specific, critical self-reflection (a generic competence) is seen as an essential precondition to be included in the ePortfolio of the medical students (Branch and Paranjape, 2002; Driessen et al., 2003).

Although highly specialized profession of health, usually, supposed to remains confined to specific competences; yet, we think that ePortfolio of health graduates must possess a good deal of specific competences including clinical skills beside a rich stock of generic competences. The researchers intend to study in this article, the significance of generic competences in the ePortfolio of health graduates from a multinational data set. The researchers are curious to study if there are some pecuniary rewards for generic competences in the ePortfolio of health graduates.

The researchers are using the data set of Reflex project which was a research project funded by the European Union under the 6th framework programmer and several national funds. This project was coordinated by the *Research Centre for Education and the Labour Market* at Maastricht University, the Netherlands. From autumn 1998 to 2000, about 40,000 graduates in total from fifteen countries (Austria, Belgium, Czech Republic, Estonia, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Switzerland and the United Kingdom) provided through a written questionnaire on the relationship between higher education and employment three to four years after graduation. At the time of survey in 2005 Graduates were in labour market.

Our analyses comprise selected variables from the enormous data set descended from the Reflex project. The researchers include only the health graduates from the Reflex data set. Health graduates rated their acquired levels of competences (Appendix A) at the time of their graduation along with the required levels of the same competences in the labour market at the time of survey which was carried out some four years later. Seven point rating scale, from very low to very high, was used in the survey.

## 2. Results

It is pertinent to mention here that all the required as well as acquired levels of competences are assessed by the health graduates included in the present study. As self-assessment is questioned for its subjectivity; as a matter of fact, this study could have been rendered dubious if Shah (2009) has not established the reliability of graduates' assessment. Now it is believed that the self-assessment is reliable.

Table 1 takes account of observations along with the mean values for all the 19 competences (mentioned in the appendix) included in the data set. Subscript A and R stand for acquired and required levels of competences, respectively. The last column contains the difference of mean values of acquired and required levels of competences. Competence 1, 6, 9 and 13 (in Table 1) are found more required than their acquired levels as assessed by the health graduates. Competences 2, 4, 5, 8, 11 and 17 are found to be almost in equilibrium. For the rest of the competences the researchers observe higher acquired levels than their required levels for respective competences.

**Table 1**

| S. No. | Competences | $n_A$ | $\bar{x}_A$ | $n_R$ | $\bar{x}_R$ | $\bar{x}_A - \bar{x}_R$ |
|---|---|---|---|---|---|---|
| 1. | Mastery of your own field or discipline | 1310 | 5.35 | 1321 | 5.88 | -0.54 |
| 2. | Knowledge of other fields or disciplines | 1303 | 4.25 | 1306 | 4.12 | 0.13 |
| 3. | Analytical thinking | 1303 | 5.24 | 1303 | 5.09 | 0.15 |
| 4. | Ability to rapidly acquire new knowledge | 1309 | 5.68 | 1313 | 5.58 | 0.10 |
| 5. | Ability to negotiate effectively | 1306 | 4.62 | 1313 | 4.57 | 0.05 |
| 6. | Ability to perform well under pressure | 1311 | 5.48 | 1321 | 5.84 | -0.36 |
| 7. | Alertness to new opportunities | 1304 | 4.72 | 1310 | 4.47 | 0.25 |
| 8. | Ability to coordinate activities | 1305 | 5.40 | 1312 | 5.29 | 0.11 |
| 9. | Ability to use time efficiently | 1307 | 5.60 | 1313 | 5.75 | -0.15 |
| 10. | Ability to work productively with others | 1300 | 5.72 | 1313 | 5.55 | 0.16 |
| 11. | Ability to mobilize the capacities of others | 1305 | 4.73 | 1310 | 4.64 | 0.09 |
| 12. | Ability to make your meaning clear to others | 1307 | 5.25 | 1314 | 5.09 | 0.16 |
| 13. | Ability to assert your authority | 1305 | 4.56 | 1313 | 4.72 | -0.16 |
| 14. | Ability to use computers and the internet | 1311 | 5.51 | 1318 | 5.19 | 0.32 |
| 15. | Ability to come up with new ideas and solutions | 1297 | 5.00 | 1307 | 4.59 | 0.41 |
| 16. | Willingness to question your own and others' ideas | 1304 | 5.32 | 1311 | 4.74 | 0.58 |
| 17. | Ability to present products, ideas or reports to an audience | 1303 | 4.65 | 1313 | 4.55 | 0.10 |
| 18. | Ability to write reports, memos or documents | 1305 | 4.93 | 1312 | 4.74 | 0.19 |
| 19. | Ability to write and speak in a foreign language | 1305 | 4.43 | 1301 | 3.86 | 0.57 |

Number of observations is denoted by *n*; whereas the subscript '*A*' and '*R*' stand for 'acquired level' and 'required level' of competences.

It is a matter of serious concern that "Mastery of your own field or discipline" has been discovered severely deficient. This is in favor of what Teichler (1999) had maintained that discipline specific knowledge is rendered obsolete at an increasing rate by the pace of technological progress. "Ability to perform well under pressure" has also been revealed sternly wanting. Furthermore, health graduates felt paucity in their ability to use time efficiently as well as assert their authority. The researchers are presenting the regression analyses for acquired and required levels of competences in the ensuing paragraphs. Table 2 (both A and B) is concerned with the acquired levels of competences whereas Table 3 (both A and B) is about the required levels of competences. In our first model, acquired levels of all 19 competences are taken as the determinant for the log of total monthly income of the health graduates. Overall model is highly significant (Table 2A), but with small value of R square as it often comes in case of large data sets (Gujarati and Sangeetha, 2007).

**Table 2A**

| Source | DF | SS | MS | F-value | P-value |
|---|---|---|---|---|---|
| **Model** | 19 | 175.62 | 9.24 | 15.64 | < 0.0001 |
| **Error** | 1131 | 668.49 | 0.59 | | |
| **Corrected Total** | 1150 | 844.11 | | | |

N=1151, R square=0.2081

Table 2B presents the analyses of acquired competences rearranged in descending order of βs. Five competences are observed to be significant and positively moving the income. Ten competences (typed in bold letters in Table 2B) are found insignificant and it is not surprising if "Mastery of your own field or discipline" falls under this group as it adds to what Teichler (1999) has pronounced as mentioned earlier in the preceding lines. Insignificant relationship, in general, exemplifies vague information.

**Table 2B**

| S.No. | Acquired Competences (rearranged) | β | S.E. | t | P | Tol | VIF |
|---|---|---|---|---|---|---|---|
| 1 | Ability to perform well under pressure | 0.19 | 0.02 | 8.47 | <0.0001 | 0.65 | 1.55 |
| 2 | Alertness to new opportunities | 0.13 | 0.02 | 6.19 | <0.0001 | 0.60 | 1.66 |
| 3 | Ability to work productively with others | 0.09 | 0.02 | 4.26 | <0.0001 | 0.58 | 1.71 |
| 4 | Ability to write reports, memos or documents | 0.07 | 0.02 | 3.96 | <0.0001 | 0.64 | 1.55 |
| 5 | Analytical thinking | 0.06 | 0.02 | 2.45 | 0.0146 | 0.68 | 1.47 |
| **6** | **Ability to write and speak in a foreign language** | **0.03** | **0.01** | **1.93** | **0.0541** | **0.79** | **1.26** |
| **7** | **Ability to use time efficiently** | **0.02** | **0.03** | **0.86** | **0.3899** | **0.58** | **1.72** |
| **8** | **Ability to make your meaning clear to others** | **0.00** | **0.02** | **-0.11** | **0.9129** | **0.62** | **1.61** |
| **9** | **Knowledge of other fields or disciplines** | **-0.02** | **0.02** | **-1.09** | **0.2779** | **0.75** | **1.34** |
| **10** | **Ability to assert your authority** | **-0.02** | **0.02** | **-0.74** | **0.4596** | **0.58** | **1.73** |
| **11** | **Ability to use computers and the internet** | **-0.03** | **0.02** | **-1.73** | **0.0830** | **0.76** | **1.31** |
| **12** | **Ability to present products, ideas or reports to an audience** | **-0.03** | **0.02** | **-1.57** | **0.1158** | **0.60** | **1.67** |
| **13** | **Mastery of your own field or discipline** | **-0.04** | **0.03** | **-1.36** | **0.1729** | **0.72** | **1.38** |
| **14** | **Ability to coordinate activities** | **-0.05** | **0.03** | **-1.93** | **0.0536** | **0.52** | **1.93** |
| **15** | **Ability to mobilize the capacities of others** | **-0.06** | **0.03** | **-1.95** | **0.0509** | **0.61** | **1.63** |
| 16 | Willingness to question your own and others' ideas | -0.07 | 0.02 | -3.07 | 0.0022 | 0.67 | 1.50 |
| 17 | Ability to come up with new ideas and solutions | -0.08 | 0.03 | -3.01 | 0.0026 | 0.52 | 1.91 |
| 18 | Ability to rapidly acquire new knowledge | -0.10 | 0.03 | -3.43 | 0.0006 | 0.59 | 1.68 |
| 19 | Ability to negotiate effectively | -0.10 | 0.02 | -6.04 | <0.0001 | 0.73 | 1.38 |

Four competences showed a perplexing comportment as these are significant but with a negative parameter estimate. The researchers thought right away that this could be due to likely multicollinearity among competences. The researchers calculated tolerance (Tol) and variance inflation factor (VIF), but, no indication of multicollinearity was traced. Although there are no standard values to decide if there is multicollinearity, however, value of VIF more than 10 or of tolerance less than 0.1 is considered an indication of multicollinearity (Jeeshim and Kucc, 2002). The fact that these competences are significant in our analyses does not permit us to leave them unnoticed. As plausible reasons the researchers may think that either these competences have not been acquired to their threshold or these are undervalued in the labour market.

*"Willingness to question your own and other's ideas"* is traced significant but with negative sign in the analysis of acquired level of competences. Perhaps, this competence is not among those which are more demanding in terms of financial output in the labour market. Either this is not important for health graduates, at all, or is less remunerated, at least, in the beginning of the career of young health graduates in the labour market. Similar is the case with *"Ability to come up with new ideas and solutions"*. This competence is significant but with negative sign in present analysis. This competence might also be not among those which are very demanding in the labour market. Acquired level of *"Ability to rapidly acquire new knowledge"* and "Ability to negotiate effectively" could also be regarded as of similar comportment.

In rather simple terms the researchers can say that these competences are acquired to a lesser level than to what they are required in fact in the labour market. And, the health graduates think that they would have been earning more than their actual earnings if these competences would have been acquired, at least, up to their required threshold level in the labour market.

**Table 3A**

| Source | DF | SS | MS | F-value | P-value |
|---|---|---|---|---|---|
| Model | 19 | 148.59 | 7.82 | 12.36 | < 0.0001 |
| Error | 1114 | 704.92 | 0.63 | | |
| Corrected Total | 1133 | 853.51 | | | |

N=1134, R square=0.1741

In the second model, logarithm of total monthly income of health graduates is regressed against the required levels of all the 19 competences. Overall model is detected highly significant (Table 3A). Small value of R square eventually results in models with large data sets (Gujarati and Sangeetha, 2007), which might help not to surprise in our case.

**Table 3B**

| S.No. | Required Competences (rearranged) | β | S.E. | t | P | Tol | VIF |
|---|---|---|---|---|---|---|---|
| 1 | Alertness to new opportunities | 0.13 | 0.02 | 7.52 | <0.0001 | 0.61 | 1.63 |
| 2 | Ability to perform well under pressure | 0.11 | 0.02 | 4.80 | <0.0001 | 0.66 | 1.50 |
| 3 | Analytical thinking | 0.06 | 0.02 | 3.05 | 0.0024 | 0.61 | 1.65 |
| 4 | Ability to use computers and the internet | 0.04 | 0.02 | 2.07 | 0.0383 | 0.56 | 1.78 |
| 5 | **Ability to make your meaning clear to others** | **0.04** | **0.02** | **1.77** | **0.0772** | **0.50** | **2.00** |
| 6 | **Ability to use time efficiently** | **0.04** | **0.02** | **1.44** | **0.1502** | **0.55** | **1.82** |
| 7 | **Ability to write reports, memos or documents** | **0.03** | **0.02** | **1.92** | **0.0552** | **0.63** | **1.58** |
| 8 | **Ability to mobilize the capacities of others** | **-0.01** | **0.02** | **-0.25** | **0.8032** | **0.50** | **1.99** |
| 9 | **Ability to come up with new ideas and solutions** | **-0.01** | **0.02** | **-0.35** | **0.7241** | **0.39** | **2.54** |
| 10 | **Ability to write and speak in a foreign language** | **-0.01** | **0.01** | **-0.71** | **0.4802** | **0.68** | **1.46** |
| 11 | **Ability to present products, ideas or reports to an audience** | **-0.02** | **0.02** | **-1.27** | **0.2033** | **0.61** | **1.63** |
| 12 | Willingness to question your own and others' ideas | -0.05 | 0.02 | -2.04 | 0.0420 | 0.45 | 2.23 |
| 13 | Ability to work productively with others | -0.05 | 0.02 | -2.02 | 0.0441 | 0.53 | 1.89 |
| 14 | Ability to assert your authority | -0.05 | 0.02 | -2.44 | 0.0149 | 0.64 | 1.57 |
| 15 | Ability to coordinate activities | -0.05 | 0.02 | -2.25 | 0.0248 | 0.51 | 1.94 |
| 16 | Knowledge of other fields or disciplines | -0.06 | 0.02 | -3.20 | 0.0014 | 0.74 | 1.35 |
| 17 | Ability to rapidly acquire new knowledge | -0.07 | 0.02 | -2.74 | 0.0062 | 0.55 | 1.83 |
| 18 | Ability to negotiate effectively | -0.08 | 0.02 | -5.17 | <0.0001 | 0.70 | 1.43 |
| 19 | Mastery of your own field or discipline | -0.10 | 0.02 | -3.94 | <0.0001 | 0.74 | 1.35 |

Table 3B provides the analyses of required competences rearranged in descending order of βs. Required levels of four competences are observed to be significant and these are positively affecting the income of the health graduates. Seven competences (typed in bold letters in Table 3B) are marked insignificant. This is not a strange thing in our analyses of required (levels of) competences. "*For early years in the earnings profile, the ability coefficient is very small, and in most cases not statistically significant*", believes Hause (1975). The last eight competences in Table 3B are significant but with a negative parameter estimate. Consequently, the researchers checked all the competences for likely multicollinearity by computing tolerance (Tol) and variance inflation factor (VIF); but, no intimation of multicollinearity was traced. Although there are no standard values to decide if there is multicollinearity, however, value of VIF more than 10 or of tolerance less than 0.1 is considered an indication of multicollinearity (Jeeshim and Kucc, 2002). Nevertheless, the researchers cannot leave them unnoticed. As a probable reason, again, the researchers reflect that these competences might be being undervalued in the labour market.

Let us peep into the literature for clear guidance in this regard. Garcia-Aracil et al. (2004) comments, "*with respect to specialised competences, it is ironic, though not surprising, that jobs where specialised competences (that is, those related to field specific knowledge) were highly required but not better paid. It is likely that these are more traditional jobs, in many cases in the public sector, having lower salaries at least at the beginning of the career*".

"*Initial earnings of people first entering the labour force could have a positive, zero, or negative simple correlation with ability. A positive correlation could indicate that those with higher ability are immediately more productive ... A low positive or zero simple correlation between initial earnings and ability could reflect ... imprecise information ... A negative simple correlation between initial earnings and ability could arise if ability is a strong complement of on-the-job training which must be paid for by reduced initial earnings*", states Hause (1975).

These two citations are fairly explaining the situation which the researchers suspected for multicollinearity, and which according to our analyses doesn't exist in our case, at all. The researchers have observed through analyses that most of the competences are not highly demanding in labour market in terms of their financial output. Either these are not important for health graduates at all, or are less remunerated, at least, in the beginning of the career of young health graduates in labour market. In other words, the health graduates think that they would have been earning more than their actual earnings if these competences would have been up in their demand in labour market.

## 3. Discussion

This study aimed at to explore the significance of generic competences in the ePortfolio of health graduates.
1. Surplus and/or deficit of generic competences
2. Relationship of earnings and generic competences

On the basis of health graduates' assessment of their competences the researchers compute mean and study the difference in their acquired and required levels of competences. "Mastery of your own field or discipline" has been discovered severely deficient. This is in accordance with the findings of Teichler (1999). "Ability to perform well under pressure" has also been marked severely inadequate. Health graduates felt scantiness in their *ability to use time efficiently* as well as *ability to assert their authority*. Seven competences, acquired as well as required levels, exhibited significant relationship with income; following is the list of these competences.
1. Ability to perform well under pressure
2. Alertness to new opportunities
3. Analytical thinking
4. Ability to work productively with others
5. Willingness to question your own and others' ideas
6. Ability to rapidly acquire new knowledge
7. Ability to negotiate effectively

In the list above, first three competences affecting the income positively are found common in the analyses for acquired as well as required (levels of) competences. The fourth competence is marked positively significant for the analyses of acquired level of competences but negatively significant for the analyses of required level of competences. Conversely, next three of the list above, are found to negatively move the income. Computation of VIF and tolerance established that there was no indication of multicollinearity.

Hause (1975) says, "*A negative simple correlation between initial earnings and ability could arise if ability is a strong complement of on-the-job training which may be paid for by reduced initial earning*". There could be a number of reasons of this negatively significant relationship. As a few of possible reasons the researchers may think that:
1. These are less demanding in terms of financial output in the labour market
2. These are not important for health graduates at all
3. These are less remunerated, at least, in the beginning of the career

"Mastery of your own field or discipline" is remarkably showing insignificant relationship with income for acquired levels, and highly negative relationship for required levels. Garcia-Aracil et al. (2004) comments, "*with respect to specialised competences, it is ironic, though not surprising, that jobs where specialised competences (that is, those related to field specific knowledge) were highly required but not better paid. It is likely that these are more traditional jobs, in many cases in the public sector, having lower salaries at least at the beginning of the career*". For future research venture the researchers propose to take into account more targeted and focused research for health graduates which may include a long enough period of their practically active time in the labour market. Larger sample of health graduates may also be of some remarkable outcome. Country wise comparison, if possible, can also be a good research track. The researchers may conclude our study by saying that it is not only interesting but important to incorporate generic competences in the ePortfolio of health graduates in modern society of information technology. Our intention is to propose only a workable idea in this regard. Undoubtedly, it needs a lot to work it out.

## 4. Conclusion

The health graduates of Europe and Japan are deficient in '*ability to perform well under pressure*'; but have surplus of '*team work competences*', '*use of ICT and Communication competences*' and '*analytical competences*'. The earnings of health graduates are positively related to the '*perform well under pressure*', '*alertness to new opportunities*' and '*analytical thinking*'; and negatively related to '*question their own and others' ideas*', '*acquire new knowledge*' and '*negotiate effectively*'.

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**Appendix**

Following is the excerpt from the Reflex Master Questionnaire. In section H1 of Reflex Master Questionnaire, graduates were to rate their competences on a rating scale of seven ranging from very low i.e. 1 to very high i.e. 7.

| H1 | **Below is a list of competencies. Please provide the following information:**<br>**. How do you rate your own level of competence?**<br>**. What is the required level of competence in your current work?**<br>*If you are not currently employed, only fill in column A* | **A Own level**<br>Very low ⟷ very high<br>1  2  3  4  5  6  7 | **B Required level in current work**<br>Very low ⟷ very high<br>1  2  3  4  5  6  7 |
|---|---|---|---|
| a | Mastery of your own field or discipline | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| b | Knowledge of other fields or disciplines | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| c | Analytical thinking | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| d | Ability to rapidly acquire new knowledge | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| e | Ability to negotiate effectively | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| f | Ability to perform well under pressure | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| g | Alertness to new opportunities | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| h | Ability to coordinate activities | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| i | Ability to use time efficiently | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| j | Ability to work productively with others | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| k | Ability to mobilize the capacities of others | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| l | Ability to make your meaning clear to others | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| m | Ability to assert your authority | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| n | Ability to use computers and the internet | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| o | Ability to come up with new ideas and solutions | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| p | Willingness to question your own and others' ideas | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| q | Ability to present products, ideas or reports to an audience | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| r | Ability to write reports, memos or documents | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |
| s | Ability to write and speak in a foreign language | ☐☐☐☐☐☐☐ | ☐☐☐☐☐☐☐ |