

An analysis of the demand for skills in the labour market in 2035 – Revised projections

Working paper 3b

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Published in March 2024
by the National Foundation for Educational Research,
The Mere, Upton Park, Slough, Berkshire SL1 2DQ
www.nfer.ac.uk

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Registered Charity No. 313392

ISBN: 978-1-916567-04-7

How to cite this publication:

Dickerson, A. and Rossi, G. (2024). *An analysis of the demand for skills in the labour market in 2035 – Revised projections*. Working Paper 3b. Slough: NFER.



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Executive Summary

In July 2022 the Office for National Statistics (ONS) announced that they had made errors coding occupational data in the Labour Force Survey (LFS) for 2021. These errors were subsequently corrected and the ONS published revised LFS data for 2021 in summer 2023.

Implications of the LFS coding errors on our analysis of the demand for skills in the labour market in 2035

LFS data up to 2021 played a central role in the production of the Skills Imperative 2035 occupational employment projections. These occupational employment projections were then combined with estimated future occupational skills profiles to produce our assessment of the demand for skills in the labour market 2035 ((Dickerson *et al.*, 2023). Given the central role of 2021 LFS data in producing our employment and skills projections, NFER, the Nuffield Foundation and Warwick IER took the decision to produce a revised set of employment and skills. This Working Paper describes the implications of our **New** skills projections and compares them with the **Old** (i.e. original) ones.

The revised employment projections to 2035

ONS originally expected that the correction would only affect a limited number of occupations, with just a modest impact on broader groups of occupations in the Standard Occupational Classification (SOC). However, this was not the case and corrected LFS data for 2021 had a more significant impact on estimates of the size of each occupation, including at the 1- and 2-digit levels of the Standard Occupational Classification (SOC), as well as at the more detailed 4-digit level. However, the impact on historical and projected future *trends* in employment is modest. Therefore, the overall effect of the errors on our employment projections is fairly minimal. However, the errors do affect the scale of change projected in each occupation's share of UK employment, and the degree to which the change in share differs between the new and old projections by occupational group.

The revised demands for skills

This Working Paper presents revised skills projections, which utilise the revised employment projections based on the corrected LFS data published by ONS for 2021. Overall, the ONS coding errors have a very modest effect on the rank order of the skills projected to be most intensively utilised across the labour market in 2035. Our original conclusions about skills demand in 2035 as reported in Dickerson *et al.*, (2023) are largely unchanged and justification for our selection of six 'essential employment skills' is thus largely unaffected by the LFS error and our analysis of skills requirements. Our six 'essential employment skills' are: communication; collaboration; information literacy; problem solving and decision making; organising, planning and prioritising work; and creative thinking.

1. Introduction

In Dickerson *et al.*, (2023), we produced estimates of ‘skills demands’ in 2035 by combining detailed occupational skills profiles together with employment projections (for each 4-digit SOC2020 occupation) produced for *The Skills Imperative 2035: Essential Skills for tomorrow’s workforce* (Wilson *et al.*, 2022a; (Wilson *et al.*, 2022b). In particular, we identified the skills that are likely to be used most intensively in employment in 2035. These were labelled ‘Essential Employment Skills’ and are:

- Collaboration
- Communication
- Creative thinking
- Information literacy
- Organising, planning and prioritising
- Problem solving and decision making

This note is a supplement to Dickerson *et al* (2023) and should be read in conjunction with that report.

In 2022 the Office for National Statistics (ONS) revealed that there had been errors in how Labour Force Survey (LFS) data had been coded by occupation (ONS, 2022a). This coding process used the newly introduced Standard Occupational Classification 2020 (SOC2020), which replaced the previous SOC2010 system. These LFS coding errors affect the employment projections published earlier in *The Skills Imperative 2035*, which utilised LFS data from 2021. By extension, they also affect the 2035 skills demand projections which were produced by combining the employment projections with detailed future skills profiles for each occupation. The ONS said, when they published the revised data, that they expected the error to have only affected the records of people in a limited number of occupations, and that the impact on estimates of the size of broader occupations and groups of occupations in the Standard Occupational Classification (SOC)¹ would be minimal (ONS, 2022b). However, the corrected data differed more substantially from the originally published data than anticipated, including estimates of the size of broader groups of occupations.

Given the central importance of the LFS data in our employment projections for *The Skills Imperative 2035* (SI35),² in particular the use of LFS data to project 2035 employment shares at the 4-digit occupational level, we decided to produce *revised* employment and skills projections using the corrected LFS data for 2021. We compare the **new** results with

¹ The Standard Occupational Classification (SOC) is a common classification of occupational information for the UK. For more details, see <https://www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassificationsoc>.

² See Wilson, R, Hillary, J, Bosworth, D, Bosworth, L, Cardenas-Rubio, J, Day, R, Patel, S, Bui, H, Lin, X, Seymour, D, Thoung C, (2022). *The Skills Imperative 2035: Occupational Outlook - Long-run employment prospects for the UK, Working Paper 2. Slough: NFER.*

the **old** (i.e. original) results to determine the impact of the coding errors on the skills requirements originally reported in Dickerson *et al.*, (2023).

The impact of the error on historical estimates of occupational employment levels in 2021 is more significant than ONS initially indicated. However, the impact on historical and projected future *trends* in employment is modest. Therefore, the overall effect of the errors on our employment projections is fairly minimal. However, the errors do affect the scale of change projected in each occupation’s share of UK employment, and the degree to which the change in share differs between the new and old projections varies by occupational group. A summary of the total differences between the revised and original projections of UK employment for 2021 by 1-digit SOC2020 occupations is presented in

Figure 1 below.

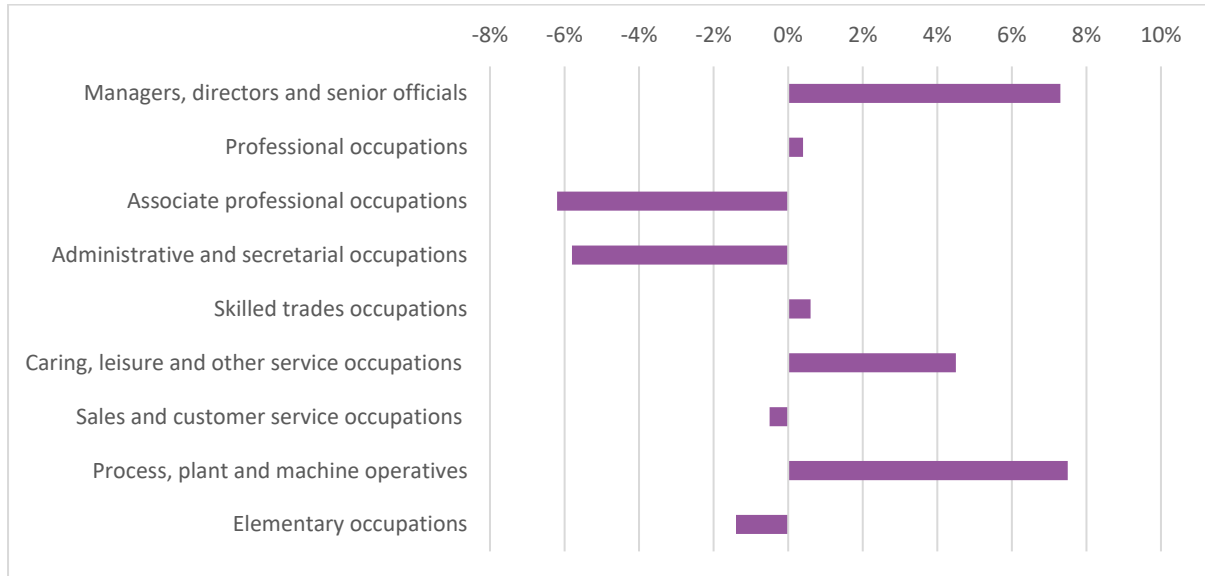
Figure 1 presents the differences in employment levels, while Figure 2 presents the percentage differences (relative to the original projections of SOC2020 1-digit employment).

Figure 1 Absolute differences between the new and old Baseline scenario in the estimated size of occupational groups, at the 1-digit SOC2020 level, in 2021 (000s)



Source: IER estimates from SI35 Original and SI35 Corrected.

Figure 2 Percentage differences between the new and old Baseline scenario in the estimated size of occupational groups, at the 1-digit SOC2020 level, in 2021 (%)



Source: IER estimates from SI35 Original and SI35 Corrected.

More detail on the impact of the LFS coding error on our occupational employment projections for 2035 is presented in [The Skills Imperative 2035: Occupational Outlook - Long-run employment prospects for the UK – Revised projections. Working paper 2d](#) (Wilson et al., 2024). Note that aggregate employment for 2021 is unchanged between the original and revised projections. Thus, the sum of all the reallocations between occupational groups must balance out.

The remainder of this document summarises the implications of the revised employment projections for 2021-2035 on the analysis of skills demand in 2035, compared to the results and conclusions originally drawn in *Dickerson et al., (2023)*.

2. Implications for estimates of the demand for skills

We begin by assessing the implications of the revised employment estimates for the skills structure of employment as indicated by the occupational distribution of employment. Recall that SOC2020 classifies jobs by broad skill level and skill specialisation. The SOC Skill levels are approximated by ‘the length of time necessary for a person to become fully competent in the performance of the tasks associated with a job’ by gaining formal qualifications or through work-based training. Four broad skill levels are distinguished in SOC2020, from Skill level 1 (low skill) to Skill level 4 (high skill) – see (ONS, 2020) and Dickerson *et al.*, (2023, Appendix E) for details. Skill specialisation is then used to distinguish groups of occupations within each of the four broad skills levels according to the field of knowledge required.

Figure 3 Employment 2020 and 2035 by UK SOC2020 Skill levels

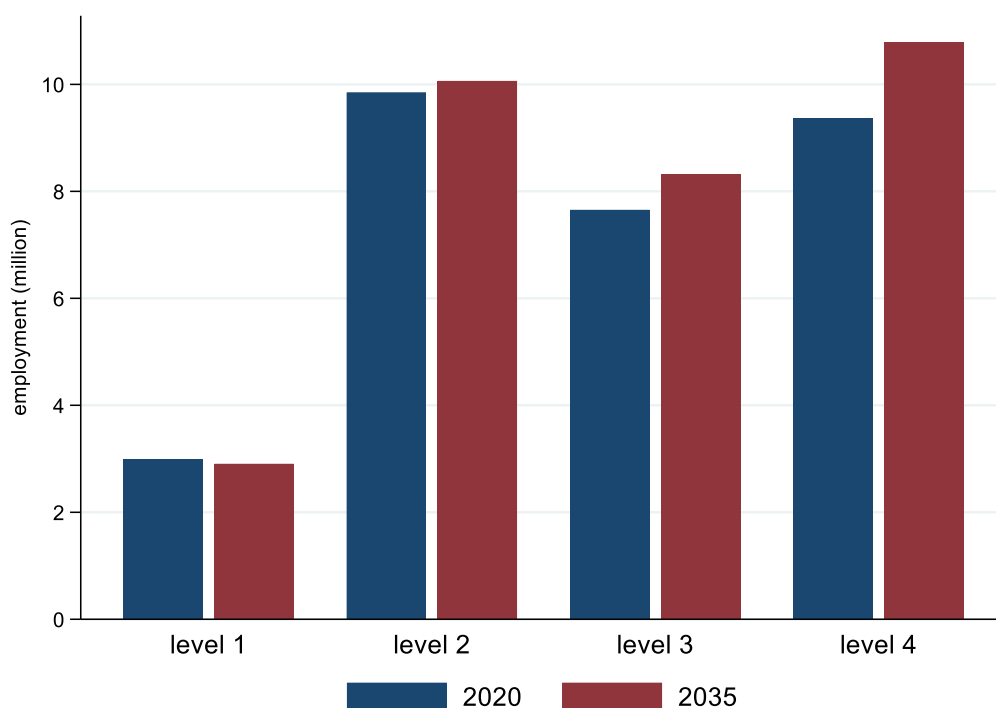
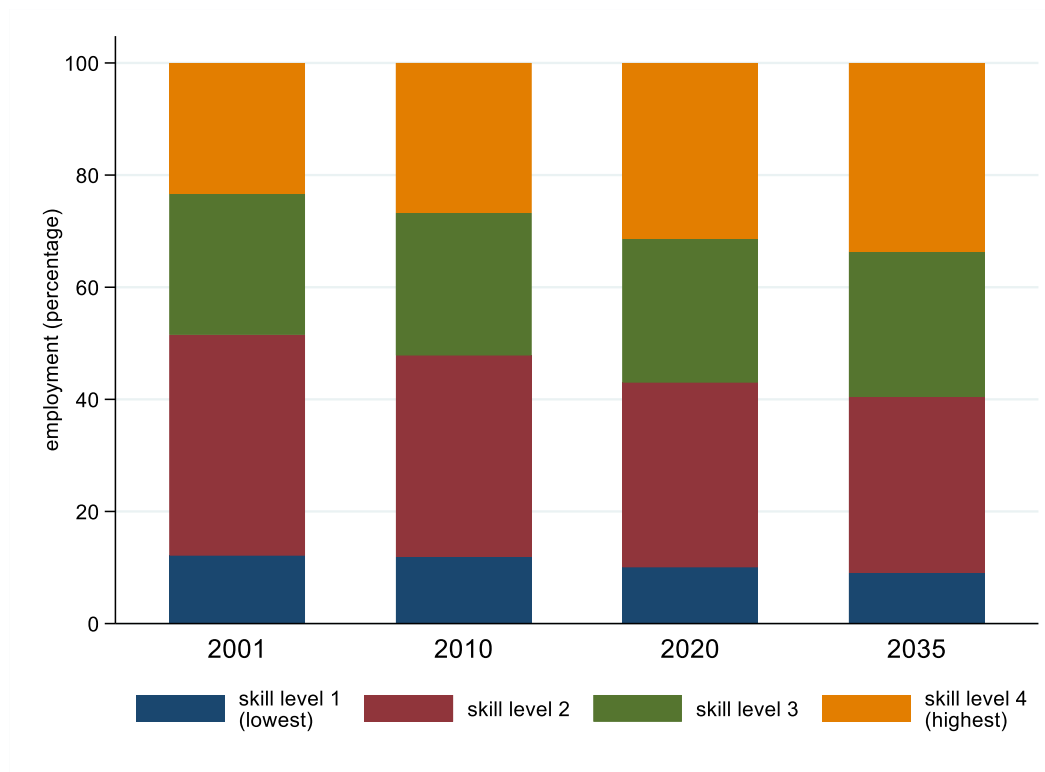


Figure 3 replicates Figure 17 in Dickerson *et al.*, (2023, p.54). Despite the revisions to the occupational structure of employment, the distribution of employment by broad skills level in 2020 and 2035 is very similar in the revised projections to that presented in the original projections. All of the projected increase in aggregate employment between 2020 and 2035 is driven by an increase in the number of jobs at Skill level 3 and Skill level 4, the highest two skill levels. Employment at the lower two skill levels – Skill level 1 and Skill level 2 – is projected to be almost unchanged between 2020 and 2035. The pattern of a broad ‘upskilling’ in employment over the last 25 years as shown in Figure 18 Dickerson *et al.*, (2023, p.55), is therefore virtually unchanged, as shown in Figure 4 below.

Figure 4 Employment shares 2001-2010-2020-2035 by SOC2020 Skill level

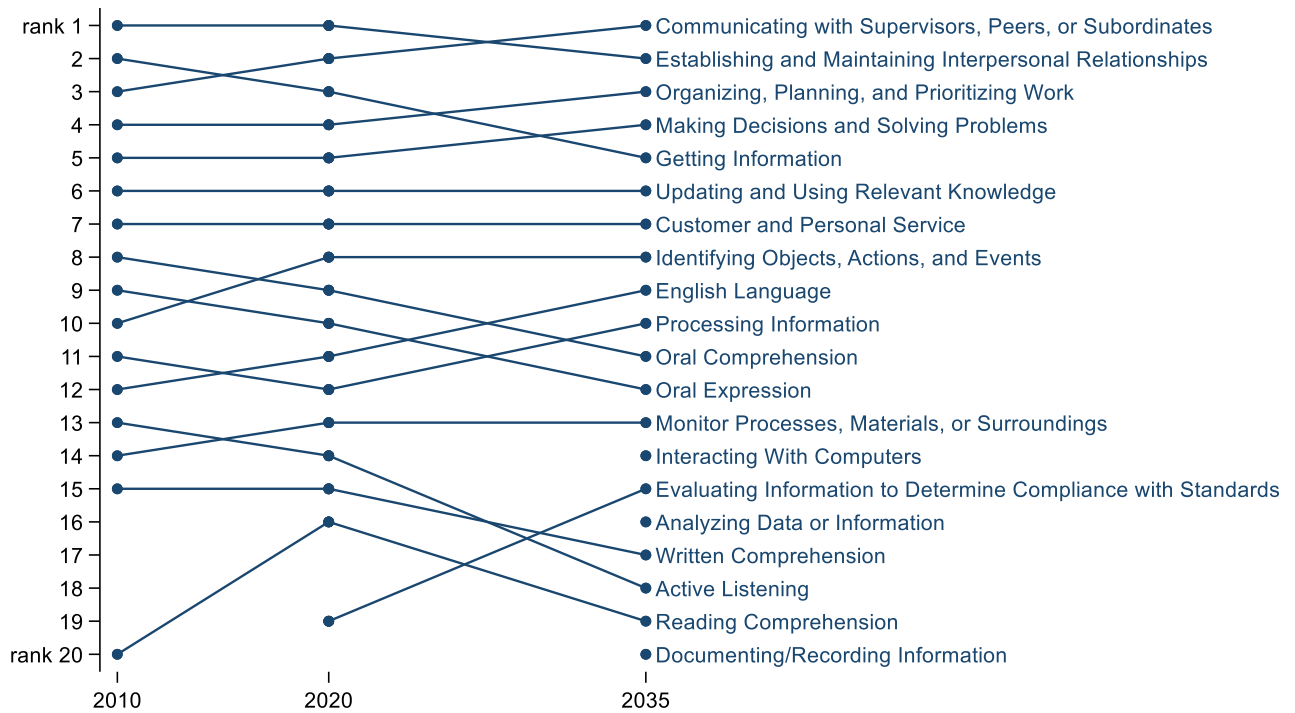


3. Implications for skills utilisation 2010-2020-2035

By combining the revised projections of the number in employment in each 4-digit occupation with our estimates of the intensity of skill use within occupations, we can compute our measure of overall skills demand for each of the 161 skills under consideration. The 'Top 20' skills that will be most utilised in employment in 2035, and the corresponding rankings in 2010 and 2020, are shown in the bump-chart Figure 5. As compared to Figure 19 in Dickerson *et al.*, (2023, p.59) using the original projections, there are a number of similarities and differences that we can note:

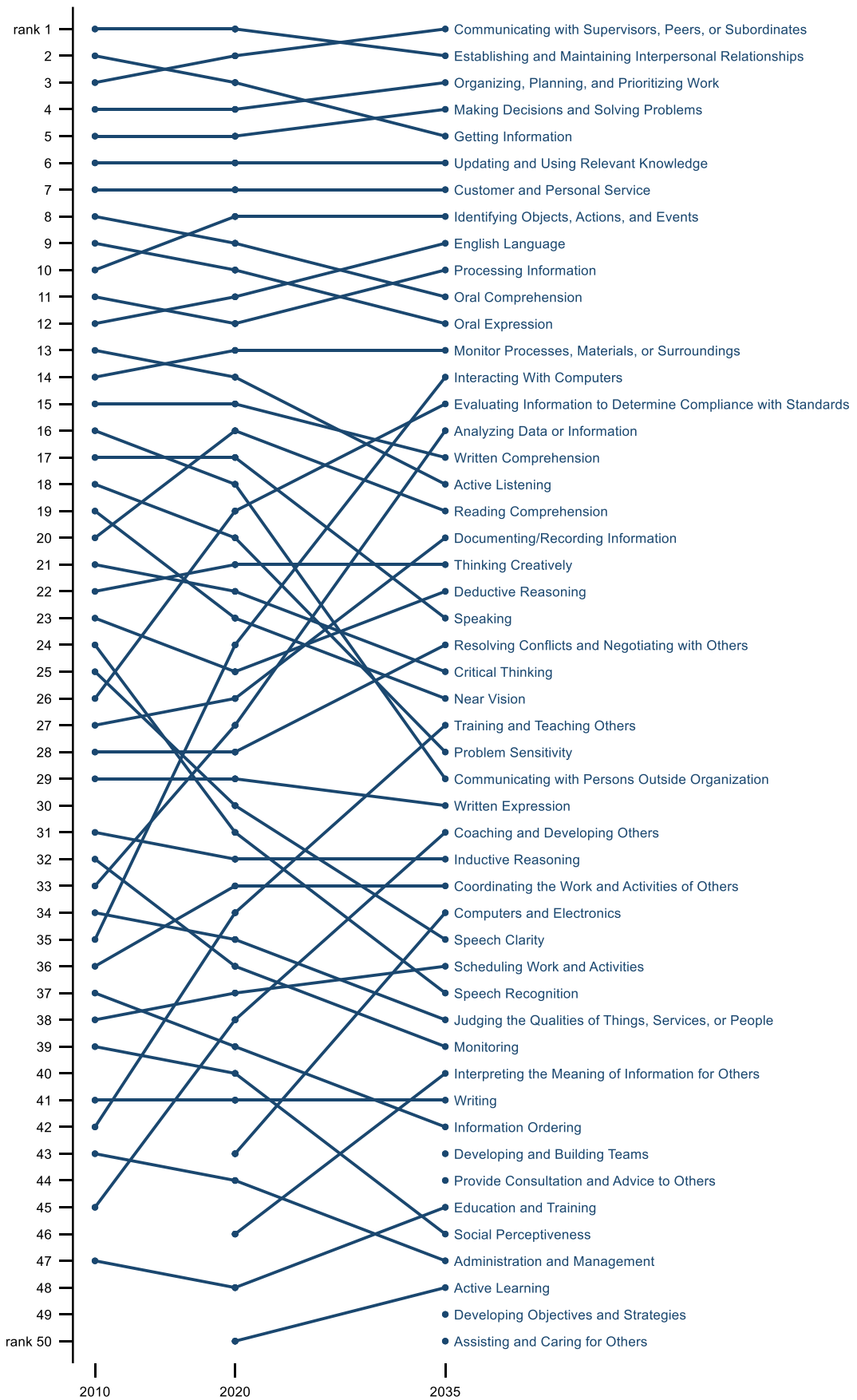
- The revision to the projections leaves the Top 20 ranking skills broadly unaffected. The skills that were projected to be used most intensively in employment in 2035 are little impacted by the revision to the 4-digit employment projections. This is consistent with stability of the overall skill structure of employment as shown in Figure 3 and Figure 4 above.
- The most noticeable change is that Organizing, Planning, and Prioritizing Work and Establishing and Maintaining Interpersonal Relationships which were ranked 2nd and 3rd respectively in the distribution in 2035 with the original projections have swapped position in the ranking when we use the revised projections.
- The only other significant change is that Thinking Creatively is no longer in the Top 20 skills. It was ranked 20th in the original projections but is now just outside the Top 20, and has been replaced by Documenting/Recording Information.
- The ranking of the 19 skills which are common to Figure 19 (using the original projections) and Figure 5 (using the revised projections) is very similar: the Spearman rank order correlation coefficient is 0.99.

Figure 5 Top 20 skills ranking – Skills Prevalence measure, linear skills projections



Beyond the Top 20 skills, there is evidence of somewhat more re-ordering of skills utilisation in 2035 when using the revised projections. Figure 6 depicts the Top 50 skills when using the revised projections which can be compared to Figure 20 in Dickerson *et al.*, (2023, p.60) using the original projections. The Top 50 skills are largely unchanged, with Assisting and Caring for Others replacing Judgment and Decision Making in the 50th rank position. And while there is some limited re-ranking beyond the Top 20 skills, the Spearman rank order correlation coefficient for the 49 skills which are common to Figure 20 in Dickerson *et al.*, (2023, p.60) and Figure 6 below is 0.99.

Figure 6 Top 50 skills ranking – Skills Prevalence measure, linear skills projections



4. Implications for skills growth and decline 2020-2035

Table 1 Top 20 skills ranked by absolute increase in skill utilisation 2020-2035 presents the Top 20 ranking of skills by absolute increase in utilisation in the period 2020–2035 computed using the revised projections of employment. Interacting with Computers still occupies the first position in the rank, and 18 of the top 20 positions are the same skills as presented in Table 6 in Dickerson *et al.*, (2023, p.67) using the original projections, although they appear in a rather different order (Spearman rank correlation 0.93).

Table 2 Top 20 skills ranked by percentage increase in skill utilisation 2020-2035 presents the Top 20 ranking based on the percentage change in skill utilisation between 2020 and 2035. Similar to the absolute increases in skill utilisation presented in Table 1, 18 of the top 20 skills are the same as with the original projections, although here the revised projections have affected the ranking slightly more (Spearman rank correlation 0.90). However, Explosive Strength, Dynamic Flexibility and Geography still occupy the first three places.

Now we turn to examining the skills rankings in terms of projected *decreases* in utilisation between 2020 and 2035. Table 3 Top 20 skills ranked by absolute decrease in skill utilisation 2020-2035 presents the top 20 ranked by the absolute decrease in skill utilisation score. Finger Dexterity, Operations Analysis, Science and Hearing Sensitivity still occupy the top four positions and in the same order as with the original projections ranking presented in Table 8 (Dickerson *et al.*, 2023, p.69). Once again, the overlap with the ranking produced using the original projections is high: 18 of the top 20 are the same skills, and the ranking is very similar (Spearman rank correlation 0.93).

Finally, we examine the skills ranking in terms of the largest percentage decreases in utilisation between 2020 and 2035. This ranking is presented in Table 4. Comparing with Table 9 from the original projections ((Dickerson *et al.*, 2023, p.70), 17 of the top 20 skills are the same, and the top 5 are in the same rank order. The Spearman rank correlation coefficient between the original and revised ranking of 0.95 reflects this similarity in the rankings.

Table 1 Top 20 skills ranked by absolute increase in skill utilisation 2020-2035

Rank	Skill	score 2020	score 2035	Δ score
1	Interacting With Computers	12.5	14.2	1.7
2	English Language	14.4	16.0	1.6
3	Analyzing Data or Information	12.4	13.9	1.5
4	Making Decisions and Solving Problems	16.8	18.2	1.5
5	Training and Teaching Others	11.4	12.9	1.5
6	Computers and Electronics	10.7	12.2	1.5
7	Evaluating Information to Determine Compliance with Standards	12.8	14.2	1.4
8	Organizing, Planning, and Prioritizing Work	17.1	18.4	1.3
9	Developing and Building Teams	9.9	11.2	1.3
10	Provide Consultation and Advice to Others	10.0	11.2	1.2
11	Communications and Media	5.9	7.1	1.2
12	Updating and Using Relevant Knowledge	16.5	17.7	1.2
13	Coaching and Developing Others	11.2	12.3	1.1
14	Monitor Processes, Materials, or Surroundings	13.6	14.7	1.1
15	Processing Information	14.3	15.4	1.1
16	Interpreting the Meaning of Information for Others	10.6	11.6	1.0
17	Communicating with Supervisors, Peers, or Subordinates	17.7	18.8	1.0
18	Developing Objectives and Strategies	9.8	10.8	1.0
19	Guiding, Directing, and Motivating Subordinates	9.7	10.6	1.0
20	Geography	3.2	4.1	0.9

Table 2 Top 20 skills ranked by percentage increase in skill utilisation 2020-2035

Rank	Skill	score 2020	score 2035	% change
1	Explosive Strength	0.7	1.3	78
2	Dynamic Flexibility	0.1	0.2	50
3	Geography	3.2	4.1	30
4	Food Production	1.3	1.6	29
5	Wrist-Finger Speed	1.8	2.2	24
6	Foreign Language	1.8	2.2	23
7	History and Archeology	1.4	1.7	22
8	Engineering and Technology	4.5	5.4	21
9	Communications and Media	5.9	7.1	20
10	Repairing and Maintaining Electronic Equipment	3.1	3.6	18
11	Fine Arts	1.0	1.1	18
12	Dynamic Strength	2.1	2.5	17
13	Design	3.8	4.3	14
14	Drafting, Laying Out, and Specifying Technical Devices, Parts, and Equipment	2.9	3.3	14
15	Interacting With Computers	12.5	14.2	14
16	Gross Body Equilibrium	1.7	2.0	14
17	Biology	2.3	2.6	14
18	Repairing and Maintaining Mechanical Equipment	3.4	3.8	14
19	Computers and Electronics	10.7	12.2	14
20	Staffing Organizational Units	5.3	6.0	14

Table 3 Top 20 skills ranked by absolute decrease in skill utilisation 2020-2035

Rank	Skill	score 2020	score 2035	Δ score
1	Finger Dexterity	5.9	4.6	-1.3
2	Operations Analysis	3.7	2.4	-1.3
3	Science	2.3	1.6	-0.7
4	Hearing Sensitivity	4.0	3.4	-0.6
5	Operation Monitoring	4.7	4.1	-0.6
6	Selective Attention	8.6	8.1	-0.6
7	Speed of Limb Movement	1.2	0.7	-0.5
8	Depth Perception	3.1	2.6	-0.5
9	Psychology	6.9	6.5	-0.4
10	Control Precision	4.1	3.7	-0.4
11	Communicating with Persons Outside Organization	12.8	12.5	-0.3
12	Management of Personnel Resources	7.6	7.2	-0.3
13	Visual Color Discrimination	5.4	5.1	-0.3
14	Arm-Hand Steadiness	4.8	4.5	-0.3
15	Multilimb Coordination	3.7	3.5	-0.2
16	Response Orientation	1.8	1.6	-0.2
17	Performing for or Working Directly with the Public	10.8	10.6	-0.2
18	Manual Dexterity	4.5	4.3	-0.2
19	Auditory Attention	4.8	4.6	-0.2
20	Negotiation	8.0	7.8	-0.2

Table 4 Top 20 skills ranked by percentage decrease in skill utilisation 2020-2035

Rank	Skill	score 2020	score 2035	% change
1	Speed of Limb Movement	1.2	0.7	-42.0
2	Operations Analysis	3.7	2.4	-34.4
3	Science	2.3	1.6	-31.0
4	Finger Dexterity	5.9	4.6	-22.2
5	Depth Perception	3.1	2.6	-16.3
6	Hearing Sensitivity	4.0	3.4	-14.9
7	Glare Sensitivity	0.8	0.7	-12.6
8	Operation Monitoring	4.7	4.1	-12.5
9	Response Orientation	1.8	1.6	-12.2
10	Control Precision	4.1	3.7	-9.3
11	Night Vision	0.6	0.5	-7.0
12	Multilimb Coordination	3.7	3.5	-6.7
13	Selective Attention	8.6	8.1	-6.5
14	Gross Body Coordination	2.3	2.2	-6.3
15	Psychology	6.9	6.5	-6.1
16	Visual Color Discrimination	5.4	5.1	-5.7
17	Arm-Hand Steadiness	4.8	4.5	-5.7
18	Equipment Selection	1.3	1.2	-5.6
19	Troubleshooting	2.5	2.4	-5.5
20	Management of Personnel Resources	7.6	7.2	-4.4

6. Conclusions

Despite the significant differences in the occupational structure of employment for 2021 following revisions to the LFS data for that year as a result of the correction of the ONS coding errors, the implications for the estimates of the demand for skills in 2035 are relatively minor. This is a consequence of two factors:

- The impact of the coding errors on the historical and projected future *trends* in occupational employment is relatively modest. This is perhaps not unexpected – 2021 is only one of many years of LFS data utilised, and employment is only one of the elements of the multi-sector, multi-region macro-econometric model that underpins *The Skills Imperative 2035* employment projections.
- While there are some modest differences between the revised and original projections of the occupational distribution of employment in 2035, the skills composition of employment is relatively unchanged.

Our assessment of the ‘Top 20’ skills that will be most utilised in employment in 2035 is very similar to that reported using the original projections. Using the revised projections, the top 5 skills in 2035 are projected to be:

- Communicating with Supervisors, Peers, or Subordinates
- Establishing and Maintaining Interpersonal Relationships
- Organizing, Planning, and Prioritizing Work
- Making Decisions and Solving Problems
- Getting Information

These are the same ‘top 5’ produced using the original projections as reported in Dickerson *et al.*, (2023), although the rank order is slightly changed. Similarly, the skills that are projected to be growing the most strongly, and in greatest decline (in both absolute and percentage terms) are very similar between the original and revised employment projections.

In summary, therefore, our assessment of the six **Essential Employment Skills** for employment 2035 is unchanged – these are :

- Collaboration
- Communication
- Creative thinking
- Information literacy
- Organising, planning and prioritising
- Problem solving and decision making

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