ABS cohort, workforce and provider landscape models

1. **ABS cohort and workforce model**

The ABS cohort model predicts which English and Maths subject routes and overall KS5 pathways all learners in a simulated 2033/34 cohort would take under ABS. The model then attaches GLH to learners’ ABS subject choices and pathways and compares the relative volume of teaching to our existing KS5 system.

**Inputs – policy assumptions:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Input** | **Baseline policy assumptions /values** | **Example features for alternative scenarios.** | **Sensitivity** |
| Design of ABS – what ABS pathways, subjects and subject routes are available? | * ABS overall pathways: 3 majors 3 minors; 3 majors 2 minors; vocational double major; L2 ABS, below L2. * Subject routes (for Maths and English): Major; Minor, GCSE resit; “Subject for life” (which captures functional L1 and below). * Subject routes (for other academic subjects): not specified. * Available subjects to study are similar to those available under the current system. | * A subject route between a GCSE resit and the ABS minor is available (“level 2.5”), particularly for compulsory Maths. * Specify learners who wish to take more than 3 majors and 3 minors. * Model the take up of subjects beyond English and Maths * Model the routes available for subjects beyond English and Maths * ABS has a reduced range of subjects available. | * Initial findings indicate that English and Maths will comprise most of the additional teaching demand; the sensitivity of ABS designs for other subjects depends on how sharply they diverge from the existing system. * NOTE: modelling further subject choices is likely to be a time-consuming additional feature of the model; we should take a proportionate approach and consider if there are other factors of the ABS policy design that would make other subject choices affect workforce and delivery impacts. Could be a consideration if ABS moves a subject on to the “shortage list” |
| Design of ABS – eligibility/ constraints on these routes | * Maths and English are compulsory, everyone who passes at GCSE takes at least a Minor * No further constraints. | * Particular pathways and routes have fixed minimum entry requirements, e.g. Major in maths requires X grade in GCSE maths; taking 3 minors instead of 2 requires XX attainment 8 score etc. * Compulsory English can be swapped for an alternative essay-based subject | * Most subject routes and ABS pathways are assumed to required similar GLH, so unless these are significantly different, overall workforce implications are not sensitive. Subject to “shortage list” as above * Parameters around compulsory Maths and English will significantly affect the “type” of teachers required to deliver ABS, especially if English can be swapped for essay-based subjects. |
| Design of ABS – GLH/ required teaching resources. | * Majors have 90% the GLH of an A level under the current system. * Minors (and all other subject routes) have 45% the GLH of an A level. * No difference in required teaching resources (staff ratios, or other costs etc.) for particular subjects, or between academic vs technical options. * Outside of English and Maths, all teachers are interchangeable. | * GLH of ABS routes diverge from initially assumed 90% of an A level. * Particular subjects require different pupil teacher ratios. * Technical routes have different PTRs to academic ones. * Some proportion of ABS teaching is delivered through online learning | * ABS GLH is highly sensitive for its workforce implication. * The level of specialism required to teach each route and degree of general degree of teacher interchangeability will affect costs. |

**Inputs – analytical assumptions:**

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| --- | --- | --- | --- |
| **Input** | **Baseline analytical assumptions/values** | **Examples features for alternative scenarios.** | **Sensitivity** |
| Learners’ behavioural response to ABS | * Learner choose ABS pathways that are analogous to their choices under the current KS5 system. * Learners select English and Maths subject routes that are analogous to their choices under the current KS5 system * ABS pathways and subject choices are predicted only by learners’ prior attainment in English and Maths. | * Interest in particular subjects is increased/decreased under ABS compared to the current system. * Interest in technical routes is different to levels seen in 2018/19 * Learners’ choices are predicted by GCSE choices (e.g L2 vocational routes), characteristics, and a wider range of subject prior attainment. | * Teaching requirements for technical routes are likely to have different costs/delivery implications; relative popularity under ABS is highly sensitive in this model. * The models predictors of learner’s behaviour will not affect the quantum of its outputs, unless we expect these predictors to be significantly different in 2033/34 relative to 2018/19. |
| Demographics | * The 2033/34 cohort is larger than our current cohort accordingly to the ONS’s latest population forecast * Other characteristics (levels of disadvantage, SEN etc.) remain at 2018/19 levels. | * Rates of SEN and FSM eligibility change, altering learners’ behavioural response to ABS (if modelled to predict it). | * Likely to have low sensitivity. |
| Cohort attainment | * Maths and English GCSE attainment remain at current levels (~68% pass rate at age 15). | * Pass rate increase towards DfE’s 90% target by 2030. | The level of teacher specialism to deliver ABS will be greater if more learners are on higher level routes. |
| Take up of apprenticeships | * Apprenticeship take-up rate remains at current levels | * Apprenticeship take up progresses towards DfE’s 40% target by 2030. | Apprenticeships are out of scope of the ABS. Apprenticships requires significantly less teaching resources than other KS5 routes. |

**Inputs – data:**

|  |  |
| --- | --- |
| **Input** | **source** |
| Simulated cohort | YPMAD 2018/19 cohort. |
| Learner behaviour | Distribution of learner subject and pathway choices in the 2018/19 YPMAD cohort, according to prior attainment at age 15 in English and Maths. |
| Demographics | ONS 2020 population projections. |
| Counterfactual GLH hours | Ofqual data on existing courses GLH. Analysis from qualification analysts on the take up rates of each qualification. |

**Outputs:**

* The chosen subject routes for English and Maths and overall ABS pathway taken by every learner in our simulated 2033/34 cohort.
* The required GLH attached to every learner’s ABS pathway. This can be compared to a modelled required GLH for these learners under the current KS5 system.
* The type of provider each learner would elect to attend for their chosen ABS pathway.
* Since when know the characteristics, location and institutions attended of every learner, we can examine the simulated ABS cohort at a wide range of levels.

**Policy questions:**

* How many learners are likely to choose each ABS pathway and ABS subject routes for compulsory English and maths?
* What are the workforce implications of different ABS policy designs?
* (Which subjects might learners choose if an essay based subject replaced compulsory English. What are the workforce implications?)
* Etc.

**Timeline**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Action** | **w/c 15th Jan** | **w/c 22nd Jan** | **w/c 29th Jan** | **w/c 5th Feb** | **w/c 12th Feb** | **w/c 19th Fan** |
| Scoping |  | Workshops to determine suitable policy inputs | |  |  |  |
| Model development | Will W on A/L | Further model development | | | Initial outputs | |
| Quality assurance | Baseline model is receiving technical QA | Further workshops with analysts to test baseline model validity | |  |  | QA of initial outputs |

1. **ABS provider landscape model**

The ABS provider landscape model is built off of the ABS cohort model. This model overlays the simulated 2033/34 ABS cohort’s subject choices and chosen ABS pathways with the capacity and range of provision delivered at KS5 providers as of 2018/19. This model will identify cold spots in our providers ability to deliver the range of provision required by ABS.

**Inputs – policy assumptions:**

All of the assumptions listed for the main cohort model will affect the outputs of this sub model.

|  |  |  |  |
| --- | --- | --- | --- |
| **Input** | **Baseline policy assumptions /values** | **Example features for alternative scenarios.** | **Sensitivity** |
| Institution provision requirements under ABS | * All learners must have access to English and Maths. | * Providers must offer a suitably broad array of subject options under ABS | * Highly sensitive as this defines what a “cold spot” is. |
| Acceptable distance for learners to travel to study in consortia | * 16km (though this will be highly toggleable). | * Differentiate acceptable distance based on location | * The number of cold spots will be highly sensitive to the acceptable distance between providers in consortia. |
| Resources required to deliver different subjects/routes | * Not differentiated except for English and Maths. | * E.g. technical courses require additional capital to deliver. (data to assess the baseline for this feature is likely to be weak). * Lower level subject routes for English and Maths do not require any particular specialism or previous pattern of provision for existing providers to deliver | * Likely to significantly affect delivery costs |

**Inputs – analytical assumptions:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Input** | **Baseline analytical assumptions/values** | **Examples features for alternative scenarios.** | **Sensitivity** |
| Capacity at providers in 18/19 | * Capacity at providers is as listed in current GIAS data. * Range of provision at providers is as described in KS5 and KS4 performance tables | * N/A | * N/A |
| Provider attended by ABS cohort | * Learners attend the same providers that they did in 2018/19 in 2033/34 | * Project demand for particular types of providers within localities | * N/A |

**Inputs – data:**

|  |  |
| --- | --- |
| **Input** | **source** |
| Baseline range of provider provision | KS5 and KS4 performance tables |
| Demand for subject provision | Outputs of the ABS cohort model. |
| Provider characteristics | GIAS |

**Outputs:**

* (Off model) data analysis describing the characteristics and range of provision within the current provider landscape.
* List of providers which are and are not able to meet the delivery demands of ABS, secondary analysis of their characteristics.
* Assessment of the location of cold spots
* Identification of learners in the simulated ABS cohort that would have access to the required provision under ABS within the current provider landscape.

**Policy questions:**

* How different does the provider landscape in 2033/34 need to be relative to 2018/19 in order to deliver ABS?
* How does the distance between the existing and required provider landscape vary across the country and according to each ABS pathway?

**Timeline:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Action** | **w/c 15th Jan** | **w/c 22nd Jan** | **w/c 29th Jan** | **w/c 5th Feb** | **w/c 12th Feb** | **w/c 19th Feb** |
| 1a,1b,1c | Analysis underway | Initial outputs | |  |  |  |
| 2a,2b,2c,2d,2e |  | Model development based on provisional baseline cohort model outputs | | | Initial outputs on baseline inputs | Further model development utilising updated cohort model outputs, and refined assumptions. |
| Scoping |  | Workshops to determine suitable policy inputs for section 2 | | |  |  |
| Quality assurance |  | QA of section 1 outputs. | |  |  | QA of initial section 2 outputs utilising baseline cohort model outputs. |