TH NKING D FFERENTLY ABOUT TIME

PART 2: HIGH SCHOOL

NCEE

THINKING DIFFERENTLY ABOUT TIME

Introduction

NCEE studies education systems with strong student performance across the globe to understand what they do, how they do it, and the context and challenges that they face. This brief shares what we have learned about how global leaders think about high school and how they organize time in school during these critical years. We also look here at home to learn from schools and districts that are rethinking high school in innovative ways.

In this brief, we look at how leading systems think differently about upper secondary time in five areas:

- Thinking differently about **options**: What kind of programs are offered to high school students? How do they vary in terms of length, focus, credentials and approach to learning? Can students change their minds?
- Thinking differently about **choice**: How are students supported to make informed choices?
- Thinking differently about **flexibility**: How is time used to personalize programs and pathways for students?
- Thinking differently about **partnerships**: How do high schools partner with other agencies and institutions to design and deliver programs?
- Thinking differently about **teachers**: How do profiles of teachers vary across programs? How does time spent preparing and teaching differ?

Some terminology

We use *upper secondary* throughout the brief to describe school that follows grade 9 or for students who are about age 16–19 or 20. In the United States, this would be most similar to high school grades 10–12. In these upper secondary systems, we look at time in years, not just in days and hours. The number of years students spend in school is highly variable, as it depends on the requirements of varied program options students choose among and the time they need to be successful.

In each area, we:

- Surface **thought-provoking observations** about ways these systems approach time differently.
- Offer **interesting examples** of what global leaders do differently and how states and districts are implementing similar strategies.
- Ask **probing questions** about the potential for using time differently and what the policy implications might be.

Our *Thinking Differently About* series focuses on learning about the policies and practices of systems with strong student outcomes and encourages outside-the-box thinking about a range of issues. Our goal is to offer examples and raise questions to initiate powerful conversations, to set the stage for educators across the United States to explore further and share lessons learned, and to inform improvements in our schools. Please approach the brief in that spirit and consider what is different, what might be useful in your context, what that would mean for rethinking policy and for school design, and what more there is to learn.

Case Study: Student Journeys

For an in-depth look at how the policies in this brief come to life, explore our case study of high school programs in Solothurn, Switzerland featuring four student journeys.

Time Continued...

This brief is Part 2 of a two-part series on time. The first brief focused on grades 1–9, the comprehensive school grades that historically marked the end of required education in many countries.

Let's think differently! Together.

THINKING DIFFERENTLY ABOUT Options

It's hard to imagine how different many upper secondary systems are from U.S. high schools. The United States has begun to reimagine high school, expanding student choice by offering early college credit opportunities, linking career preparation programs to new and emerging industries, and mapping pathways that connect high school to post-high school programs. But our high school innovations occur with well-established boundaries: students spend four years in high school with the majority of time in general education classes, and they end their K–12 journey with a high school diploma.

What choices do students in other high performing countries have? At the age of 15 or 16, students are able to choose what they want to learn, how they want to learn it, and how many years they will remain in school. The system offers a wide array of choices, all aligned to projected economic and workforce needs, with many options for students to adjust their journey along the way and shift direction if their interests and goals change.

Thought-provoking observations and interesting examples:

Students can choose university preparation programs.

University preparation programs give students direct access to the university system, preparing them for specialized majors in higher education. Most traditional universities in leading systems require students to apply directly to specific programs or departments, such as medicine or law, when they enter the higher education system. As a result, upper secondary preparation programs typically require students to decide on a focal discipline or program so that they are prepared to apply to university. Students choose a limited number of aligned subjects to study in depth, and they take graduation exams in required prerequisite subjects as part of the application process.

Examples

- In Ireland, students interested in attending university can enroll in a two-year Leaving Certificate program for their senior cycle of secondary school. The only entry requirement is successful completion of the junior secondary cycle. Most of their time is spent in two-year courses focused on the four or five "exam" subjects they choose based on their interests and the requirements of specific university programs. Courses are offered at two levels: Ordinary or Higher. Each university program has specific senior course and grade requirements. For example, University College Dublin requires that students applying to agricultural science programs take laboratory science at a Higher level and that they meet a minimum score requirement.
- In Singapore, students who meet proficiency requirements and enroll in the two-year university preparation A-level (or advanced) program following lower secondary school choose three A-level subjects, in addition to overall program requirements. These subjects are chosen to meet specific prerequisite requirements of different university programs. For example, students interested in AI computing at Nanyang Technological University need to take math, physics, or computing at an advanced level.

A Look at Some Upper Secondary Choices by System

- **In Singapore, when students complete grade 10 or 11, they choose among three main options. They can choose a university preparation program and, within that, which set of four or five subjects to study. They can choose a vocationally-focused program in one of 14 different industry areas that includes a work placement of at least six months. Or they can choose direct enrollment in more than 30 polytechnic-level diploma programs.**

- **In Denmark, after grade nine, students choose among four higher education preparation programs or an apprenticeship. The higher education preparation programs include general university preparation, specialized university preparation for commercial professions, specialized university preparation for technical professions, and a professional preparation for careers that require a two-year diploma. Students also choose among over 100 apprenticeships, with varying amounts of general education integrated in the program depending on the specialization.**

- **In Hong Kong, students choose between a three-year senior secondary program to prepare for university or one of three types of vocational education programs that range from one to three years. The baccalaureate program includes general education courses that qualify students to apply to university upon completion. Vocational offerings include one-year certificate programs and three-year vocational diploma or baccalaureate programs. Each is offered in a range of industry areas and all qualify students for work.**

- In Denmark, secondary students who want to go to university and meet proficiency requirements on exams and class grades complete a three-year Higher General exam program that includes a set of compulsory subjects and a specialized study program. Specialization includes advanced study in two or three subjects. Danish university programs specify which subjects students need to have and at what level. To major in business economics at Aarhus University, for example, students need to have advanced studies in mathematics and in history, history of ideas, or international economics.
- Project Lead the Way (PLTW) is a STEM-focused program in computer science, engineering, or biomedical sciences offered in grades 9–12 in over 10,000 schools in the United States. Students typically take two classes each year in their program area and complete a capstone project. In engineering, for example, courses include a choice of Environmental Sustainability, Computer Integrated Manufacturing, Aerospace Engineering, and Digital Electronics.

Key Differences in Higher Education

There are some key differences in how higher education is structured in many leading systems:

- **There are fewer traditional universities. Bachelor's degrees are specialized; they do not include general education.**
- **There is a robust sector of applied universities and polytechnic institutions that offer practice-based BA and MA degrees. This sector is often larger than the traditional university sector.**
- **Colleges offer two-year degrees and certifications in professional and technical areas, and are often specialized.**

Students can choose professional preparation programs.

Professional prep programs prepare students for direct access to career-specific specialized professional universities such as a University of Applied Sciences, a Polytechnic or a Business Academy. Students select a specific career goal when they enter this upper secondary program, then they continue in specialized professional schools to complete their preparation program.

Examples

- In Switzerland, students can enroll in three-year specialized programs to prepare for certain professions including teaching, social work, or art and design. These programs have proficiency requirements for entry, but they are not as rigorous as the ones for the pre-university program. Programs lead to a certificate for admission to specialized non-university higher education programs or to admission at a university of applied sciences. The applied university route requires an additional year of study and an internship.

- Students in Taiwan can enroll in five-year junior college programs that fulfill the combined requirements of secondary vocational schools and a two-year professional degree in a professional area. The five year program does not save time, but allows students the opportunity to finish high school in college and focus more of their program on practical experience. Students are required to apply to this program, have demonstrated interest in the program area, and participated in 8th grade exploration opportunities.
- In Denmark, students can enroll in one of three different professional preparation programs. One is the two-year higher preparatory program that offers specialized preparation for professions that offers specialized preparation for professions that require a two-year professional diploma, such as digital marketing or construction management. The other two options are three-year programs to prepare for commercial and technical careers that qualify students for degree programs at universities of technology or applied sciences. All three programs include practical experiences and projects in the chosen professional area. Students meet proficiency requirements on their exams to ensure they are prepared to be successful.
- In Delaware, the Pathways Program gives students the opportunity to get work-based learning experience and take CTE courses that count toward a two-year degree in over 20 professional pathways areas such as architectural engineering, plant science, and nursing. Students can also take additional dual enrollment courses that fulfill requirements in that program.

In Switzerland, teaching is considered a "practice-based" field so preparation is part of the applied university sector. Students who want to be teachers study for a specialized baccalaureate in teaching—which requires classroom experience—for admission to either a teaching program at a university of applied sciences or at a university of teaching.

Students can choose workplace prep apprenticeship-style programs.

Workplace prep programs prepare students for direct access to specific careers in the workplace, with continuing opportunities for longlife learning built into their ongoing career experiences. While many U.S. secondary school career programs include some work-based learning, apprenticeships give students workplace experiences of a different order. In these systems, students spend significant amounts of time in apprenticeships learning on the job outside of school settings. Even programs that require more general education have students spend as much as one-third of their total program time in the workplace.

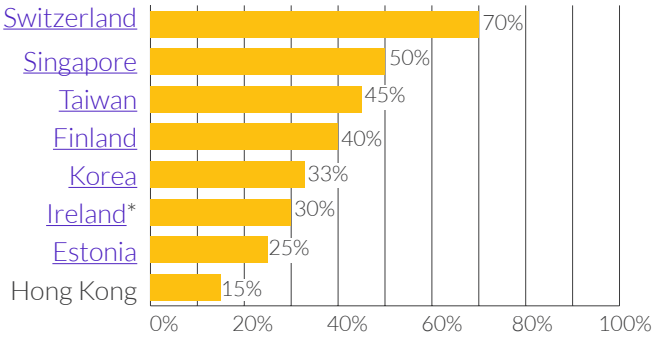
Examples

- In Denmark, students enroll in three-year apprenticeship programs in one of over 100 areas. All programs include an initial six month or full year basic school program followed by alternating periods of time in the workplace and in school. These rotations are 2–6 months long, with the amount of time in the workplace lengthening each year. Students are paid apprenticeship wages for their time on the job.

- In Switzerland, students can enroll in 2–4 year vocational certificate or diploma programs in over 200 different professions. The length of the program depends on the profession, as do the entry requirements. Students spend 3 or 4 days a week in paid apprenticeships and the other 1 or 2 days in classroom instruction related to their specialization. This means that sixty to eighty percent of their program is spent in the workplace.
- In Estonia, students attend a three-year vocational high school to study for qualifications in close to 100 vocational areas. Programs for the vocations vary, but all require at least 35 percent of the program time is spent learning in the workplace.
- In Colorado, students can apply for "modern youth apprenticeships" in areas such as finance, real estate, graphic design, and cyber security that begin while they are still in high school and continue after graduation. Before graduation, students split their time between high school classrooms and the workplace, earning a wage while receiving hands-on experience where they can apply what they are learning in school. The apprenticeship program continues after students graduate, and by the end of the program students have earned an industry credential with the opportunity to earn debt-free college credits.

In many systems, university preparation is not always the most common or even preferred option. Often, a significant percentage of students choose a professional or workplace preparation pathway in upper secondary school. This percentage varies across systems, however, as shown in the graph on the right.

Percent of students who choose professional or workplace prep pathways in secondary school



*Data for Ireland includes those who enroll in Leaving Certificate Vocational (LCV), Leaving Certificate Applied (LCA), and apprenticeship programs.

Students can change their mind along the way.

While students make important choices at an early age in many systems, these systems of schooling are increasingly flexible; a key feature is the lack of dead ends. University preparation students can access specialized career universities by meeting extra requirements. Professional preparation students can access the traditional university system by adding more time in school and meeting entry exam requirements. Workplace preparation students can access traditional as well as professional career universities with extra time in school and meeting exam requirements.

Examples

- In Switzerland, apprentices can add a year onto their program to take additional general education coursework and earn a Vocational Baccalaureate. This fulfills the requirements for applied degree programs at universities of applied sciences. Some students take this extra coursework within the regular program timeline by cutting back on the amount of time they spend at the workplace. Students with a Vocational Baccalaureate can also take an additional exam to qualify for admission to research universities.
- In Ireland, students who complete the Leaving Certificate Applied program in upper secondary school—which is a practice-based route that does not fulfill pre-university requirements—can add time by enrolling in pre-university courses that qualify them to apply at universities. Universities reserve spots for students entering full degree programs from this route.
- In Singapore, students in the university preparatory A-level program can choose to apply to polytechnics or technological universities rather than research universities if they decide they prefer an applied learning experience. To do this, they can participate in a special "direct admission" route and often can use some of their A-level courses to qualify for advanced standing.
- In the United States, community colleges offer similar flexibility. Students can choose different program options, shift direction, and stack credentials and credits. In Ohio, there are 20 guaranteed transfer paths from two- to four-year degrees. In Rhode Island, apprenticeships are counted toward a degree program. Virginia offers Credits2Careers, a program that awards credit towards degrees for prior work experience. Florida gives credit for specific industry credentials towards two year degrees. Indiana lays out pathways within industry areas to four-year degrees.

Korea has instituted a "Jobs First, University Later" policy. They offer a special subsidized university entrance track for candidates with work experience. They hope to encourage students to consider work and career preparation programs in secondary school and use work as an alternate route to university. This policy was instituted in response to concerns about shortages of technically-trained workers and a lack of career opportunities for many young people with university degrees.

Probing questions:

- What seems most different about how high school is organized in the other systems highlighted here? Do you see benefits for students in these approaches?
- Are there ways that your state, district, or school is trying to take similar approaches? Do these examples make you think about ways to expand or push those approaches in new ways?
- Are there policy barriers to changing high school in some of the ways other systems organize programs for students? Are there untapped opportunities to explore?

Notes

THINKING DIFFERENTLY ABOUT

Choice

The upper secondary choice system gives young people agency over their lives, and they make important career and life choices at an early age. To support students in making these choices, systems set aside significant time to let students explore careers. The system also supports students in changing direction if they find they need to make adjustments along the way.

Thought-provoking observations and interesting examples:

Systems offer guidance and information to support students in making upper secondary program choices.

One way students are supported in making program choices is through formal career information and advice programs. Through these programs, students get clear information about different careers. They get expert guidance and can link their current skills and proficiency levels to success requirements in different careers and preparation programs.

Examples

- All Swiss communities have Career Advice and Information Centers (BIZ) that are used by secondary school students to research apprenticeships and different education and training options. They are staffed by workforce experts, a set of whom at each center are trained to work with young people. Switzerland publishes prerequisite skills profiles of each vocational program so that students know exactly what skills they need to be successful in the program.
- Municipalities in Denmark have youth guidance units whose staff works across schools to help prepare students for the transition from lower secondary to upper secondary. They coordinate exploratory activities and provide group and individual counseling and information sessions and introduce students to the national career guidance portal. Ninth grade homeroom teachers are given time to work with students to prepare application portfolios for their upper secondary school choices.
- Singapore has education and career counselors in each school who work with students individually to plan their education and career paths. There is also a My SkillsFuture national portal with tools for students starting in 5th grade to use to reflect on interests and learn about educational pathways and what prerequisite skills are needed for success in each.

- In Montgomery County, Ohio, schools partner with the Business Advisory Council to provide a sequence of opportunities from elementary school to high school to teach students about careers, expose them to career options, and introduce them to training pathways. All students choose a career pathway in 8th grade, based on the YouScience interest survey, and do one or more job shadowing experiences to confirm their interest.

Lower secondary schools build in authentic exploration experiences to help students make informed choices.

Leading lower secondary systems create time for students to explore upper secondary programs before they make choices. This is true across program types, including university preparation options.

Examples

- Singapore lower secondary schools offer applied subjects in areas like computing, electronics, exercise and sports science, mobile robotics, smart electrical tech, and retail operations. These subjects help students learn about career areas in which they may want to specialize in university or industry preparation programs.
- In Denmark lower secondary schools are required to provide "taster" courses for students to try out upper secondary options. These involve 2–3 day visits to each program; students can choose which ones they want to visit. Students who are unsure of their direction are offered additional "taster courses" for up to four weeks.
- In Taiwan, students in their last year of lower secondary school can choose a technical skills program which allows them to "try out" different vocational subjects to gauge their interest. They spend 40 percent of their time in this program.
- The U.S. Department of Defense Education Activity (DoDEA) Schools enroll all 6th graders in nine-week introductions to a "wheel" of CTE program options such as Applied Technology, Intro to Electronics, Graphic Design, and Business Enterprise. Seventh and 8th graders can take semester or year-long courses in each of these areas.

In Denmark, vocational programs are structured to give students opportunities to stagger their choice of specialization. There is an initial six-month school-based basic program. The first three months are common to all vocational areas; after that, students choose one of four vocational cluster areas (care, health, and pedagogy; administration, commerce, and business services; food, agriculture, and hospitality; and technology, construction, and transport). Students then choose specific specializations for their apprenticeship and school program.

Students can add a transition year to prepare for making upper secondary choices.

Some systems are even more bold in building in time to support choice, giving students the option of adding a full year into their overall sequence of schooling. This extra year is for all students, not just those choosing a vocational focus. They can use this extra time to explore possibilities, to work on core skills, or to take on a combination. The goal is to give students the time they need to make better informed choices and to be better prepared to succeed once they choose.

Examples

- In Finland, students can enroll in an optional 10th grade general preparatory year (TUVA) which focuses on career planning and skill preparation for either the upper secondary general or vocational school. An individual study plan is designed for each student. The program previously catered only to students preparing for the vocational upper secondary school but was broadened to those preparing for both general and vocational upper secondary in 2022.
- Estonian schools offer a special one-year bridging curriculum for students unsure of their career focus. The curriculum is 30 percent basic studies and career planning and 70 percent elective modules that allow students to try out different interests to help choose an academic or vocational direction. This gives students an additional year to study and explore before entering an upper secondary program.

In many U.S. cities, middle school students are offered opportunities to try out different CTE programs during the summer. In Chester County, PA, 6th to 9th graders can attend week-long career academies in areas such as Aerospace Exploration, Criminal Investigation, and Cosmetology and Barbering. There is one on entrepreneurship called Tomorrow's Millionaires to build new products or start businesses or social ventures to "change the world" and another called You Can Fix It to introduce students to the basics of carpentry, plumbing, electrical, and automotive skill.

Swiss companies offer students "trial weeks" so they can gauge their interest in a particular apprenticeship. For example, MawaTech, a precision mechanics company, advertises one-week trial apprenticeships or two-day vocational experiences for students interested in its apprenticeships in polymechanics, production mechanics, and practical mechanics. The Federal Office of Civil Aviation offers trial days for their commercial apprenticeships, one focused on media.

Ireland's Transition Year

Ireland's Transition Year is a unique "gap year" for students before they transition into upper secondary school at about age 16. It was first introduced in 1974, and became a widespread feature of Irish schools in the late 1990s. Since then, participation has grown to over 70 percent of students. According to the Ministry, the Transition Year aims to

- help pupils transition from a highly-structured environment to one where they will take greater responsibility for their own learning and decision making;
- offer active and experiential learning to help students develop a range of transferable critical thinking and creative problem-solving skills; and
- provide an opportunity to reflect on and develop an awareness of the value of education and training in preparing them for the ever-changing demands of the adult world of work and schools.

Each school designs its own program to best fit the needs and interests of its students, which include

- **Core courses:** Students continue core subjects like English, Irish, math, and physical education, but these are often shaped around themes and projects. For example, a class might put on a production of a play rather than just read it in English class or learn Irish dances in Irish class. Students who need extra help are given it in small groups.
- **Sample modules:** These are short "taster modules" of subjects that students will choose among in upper secondary. Many of the subjects offered—such as Politics and Society, Design and Communication Graphics, Applied Mathematics, Accounting — are ones that students have never been exposed to before.
- **Interest-based modules:** These are modules and activities students choose based on interest, designed to spark curiosity and provide opportunity for independent and self-directed learning. The Ministry has developed 45-hour modules for schools to use, including Global Development Issues, What Is the Weather, Discovering Irish Art, Intro to Genetics, and Biotechnology.
- **Transition activities:** These include community service, work experiences, and speakers. Schools are specifically tasked to work with partners in the community to develop these opportunities.

Probing questions:

- What is notable about how students are prepared for choosing their upper secondary school programs in the systems highlighted here?
- Is a transition semester or year feasible in the U.S. context? Would something like that be useful?
- Are there approaches that you think would be useful for your school or district to adopt? Would any policies or rules need to change to do this?

Notes

THINKING DIFFERENTLY ABOUT

Flexibility

In many leading systems, time is used flexibly to personalize programs to better serve student needs. School is not one size fits all.

Thought-provoking observations and interesting examples:

Upper secondary is not a standard number of years

High school in the United States is a standardized four-year program. In many leading systems, upper secondary programs vary in length and there are significant differences in the time available for learning across pathways and programs. Students choose a particular pathway, set their postsecondary education goals, and can vary the time they need to succeed.

Examples:

- In Switzerland, upper secondary programs vary from two to four years. The academic program is four years; industry apprenticeship programs leading to vocational diplomas are two to four years, depending on the career area; and programs for teaching, social work, and other professions are three years.
- In Singapore, upper secondary programs are one to three years. The A-level university preparation program is two years, whereas the basic industry certificate program (Higher NiTEC) and technical diploma programs are three years. There are also 1–2 year work-based programs that provide students with a basic industry certificate.
- In Hong Kong, students have options that range from a few months to three years. They can complete either a Diploma of Secondary Education (DSE) or Vocational Education (DVE) in three years. There is an option of completing the DVE in 1.5 years if a student enters with more years of secondary education. There are shorter industry Certificate programs as well, which range from a few months to two years, depending on the specific vocation.
- In Ireland, students have options that are from two to four years. The senior cycle of secondary school can be two years or three years, depending on whether students participate in a 10th grade Transition Year focused on career exploration. Students can also enroll directly in two- to four-

year apprenticeship programs following lower secondary school. These are offered for occupations in traditional trades as well as new industries—digital marketing and accounting technician, for example. Students attend school at education centers alongside their apprenticeship.

- In Kentucky, students can graduate from high school in three instead of four years through the Early Graduation Program. Students earn ten foundational credits and must complete a financial literacy course, a capstone project, a resume, and an application to a postsecondary institution.

Calendars often vary to best meet the needs of each program.

There is not a standard calendar for upper secondary. The number of days and how they are distributed often vary according to the pathways students choose.

Examples

- In Switzerland, apprentices have five weeks of vacation since they work part time during the summers, whereas students in university and professional school preparation programs have 13 weeks of vacation each year, which is the same as students in primary and lower secondary schools.
- In Singapore, students who study at the Institute for Technical Education (ITE) have the option of enrolling in a traineeship which allows them to work full time and attend class one or two days a week and earn their NiTEC certificate. Students work full days, year-round in this program, whereas those in the standard NiTEC program are on a standard quarter schedule, with 13 weeks of vacation distributed among them.
- Mercedes Benz's Modern Manufacturing Apprenticeship Program offers high school students in Vance, AL, paid apprenticeships for 12–30 hours a week alongside their high school CTE courses and over the summer. Students can also get dual enrollment credit toward an AS degree in industrial maintenance or auto repair. Graduates are offered full-time jobs at Mercedes Benz and can access annual tuition reimbursement for up to $6000 to complete a postsecondary degree program while working.

At Roskilde Technical College in Denmark, the vocational diploma program starts four times each year (August, October, January, and April). The vocational baccalaureate program, which prepares students for university in addition to the vocational diploma, only starts once a year in August.

Subjects are modularized and organized into short courses.

Subjects for upper secondary students are often organized into modules or short courses rather than into the longer courses that are standard in U.S. high schools. This gives students and teachers more flexibility in both pacing and sequencing of learning.

Examples

- Estonia's upper secondary schools organize their programs into 35-hour courses. Students are required to take 96 courses to graduate. Subject areas have different numbers of courses so time varies across subjects.
- In Korea, students need 192 credits to graduate from either a high school or a vocational school. Each credit is about 16 hours. Courses are organized in different "sizes" ranging from 1–4 credits. Core math and Korean courses are 4 credits; a music class might be 2 credits; a science lab is 1 credit.
- Ireland's Leaving Certificate Applied program organizes its two-year program into 44 modules, each estimated to be 30 hours. If a student chooses Craft and Design, for example, there are 15 modules organized in four areas: fashion and textiles, graphic communication and print media, three-dimensional studies; and lens-based studies.

Time for independent learning is a staple strategy.

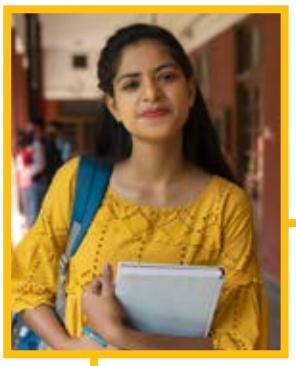
Students build capacity to direct their own learning through opportunities to learn independently in upper secondary.

Examples

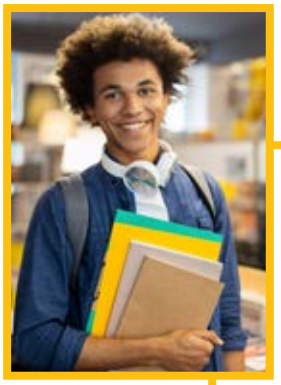
- In Denmark, students in the upper secondary programs can complete up to 20 percent of their coursework virtually. All programs require an individual independent project.
- In Estonia, students in the general upper secondary school often spend a day each week or every other week learning virtually or independently. A good part of their senior year is spent on a self-directed research project required for graduation.
- In Korea, a key part of the curriculum of Meister high schools—which are organized around specific industry sectors—is project based learning, which requires students to plan and carry out an independent project. The aim is for students to develop the capacity to identify and solve projects on the job. There is an annual exhibition of projects across these high schools.
- Students in Singapore university preparation programs learn independently at least two days each month. This is intended to empower students to "take charge of their learning." They also are required to complete a year-long project in groups of 4 or 5; the group chooses a topic and develops written and oral presentations of their findings.
- The Los Angeles, CA, Unified School District created six Virtual Academies. They are in six career areas (STEAM, Arts and Entertainment, Computer Science, Business and Entrepreneurship, International Studies and World Languages, Leadership and Public Service). At the secondary level, they involve a mix of asynchronous and synchronous learning in the mornings, and then guided project and individual work in the afternoons.

Adjusting Time for Support and Acceleration

Schools offer an array of strategies for supporting students who need extra help as well as for enabling advanced students to progress at a faster pace or with more difficult work. The use of time is flexible and shifts in response to individual student needs.



- **Retaking classes:** Swiss baccalaureate schools allow students to retake classes if they struggle initially. Almost 10 percent of students do this at some point in the four-year program and are then able to succeed in the classes. One school head said: "I tell students that taking extra time to be more confident in the skills they need is so much more important than graduating on time. They will live 70 years or more; a few months will not make a difference in the long run."
- **Extended program time**: Students in Singapore's National ITE certificate programs can retake any course they struggle with in the following term or they can extend their program by a semester and catch up on coursework then. The ITE program director said that they encourage students to extend the end of their program to fit in the extra course work so that they have adequate time to focus.
- **Slower-paced classes:** In Singapore, students have the option of enrolling in a slower paced A-level university prep program in the Millennia Institute (MI) if they need more time to build their core skills or want to progress at a slower pace. The MI program is three years; the typical A-level program is two years.



- **Recovery year:** Switzerland has a Bridge Year for students who are unable to secure an apprenticeship to give them time to work on core skills and language skills and reapply to apprenticeships.
- **Extra Year:** In Finland, students can take an extra year in between basic school and upper secondary school to focus on career planning and take any coursework they might need to apply to their preferred program.
- **Early start:** Switzerland allows students in lower secondary school to start the academic baccalaureate program early if they are ready. They complete it one year ahead of students in the standard program.
- **Accelerated program:** In England, students can take an accelerated one-year virtual A-level program rather than the standard two-year program.
- **Proficiency:** Denmark has a New Apprenticeship which allows apprentices to study general education classes independently and take the apprentices exam whenever they are ready, even if it is before the end of the usual program.
- **Summer school**: In Hong Kong, students in the Diploma for Vocational Education (DVE) program have an optional summer term to accelerate progress toward their diploma or extend their time in a work placement.

Probing questions:

- How is school time organized differently in these systems than in your own school or district?
- Do schools and districts in the United States have the flexibility to implement any of these strategies, if they seem useful?
- Are there approaches that your school or district might adopt to help personalize learning experiences for students?

Notes

THINKING DIFFERENTLY ABOUT Partnerships

Upper secondary schooling is the initial level of a longlife learning system and, as such, is part of a broader system than just K–12, as in the United States. Public and private partners are directly involved in planning and delivering programming that meets the workforce development goals of the system while also ensuring individual opportunity for continued growth across their years in the workplace. Upper secondary programs are the springboard for long life success.

Thought-provoking observations and interesting examples:

Partners from economic development and industry work together to guide upper secondary programming.

High performing systems monitor economic trends, plan ahead for the economy they want to build, and connect upper secondary options and programs to workforce development needs. By connecting upper secondary programs to workforce development, systems are able to connect students with viable careers that will lead to individual economic success and security

Examples

- Singapore's SkillsFuture agency creates industry transformation maps for each sector and plans future programming against its projections starting in upper secondary school. It monitors the slots available in programs from the high school years and beyond to ensure it has the workforce it needs and that students are prepared for jobs with growth opportunities that offer economic security. This includes education for a wide array of careers, including doctors as well as information and communications technology (ICT) specialists.
- Taiwan organizes its workforce development programs around its economic strategy, which promotes six emerging industries (such as biotech and green energy), four smart industries (such as cloud computing and electric vehicles), and 10 major service industries (such as international cuisine, pop music and digital content, and urban renewal).

- Finland's Ministry of Education and Culture has a Skills Anticipation Forum to look at economic and workplace trends and revise upper secondary programs proactively in response. This work is done in partnership with the Ministries of Finance, Economic Affairs, and Health and Social Affairs. Their data informs decisions about what programs to offer and how much to invest in each. For example, it made recommendations about better preparing for the green transition, including expanding technician training for the heat pump industry.
- Indiana maps high value industries each year and then funds CTE programs that have high, moderate, and less than moderate value to the state at different rates to incentivize districts to expand high value programming. It also has a Next Level Jobs program that provides free tuition and subsidies to employers for training employees in high-demand and value fields.

One key current priority in Singapore is to build general AI skills across the workforce plus a corps of specialized AI workers. In response, it is updating the curriculum of all programs to include AI skills and adding new advanced programs to triple its AI specialists workforce to 15,000 in the next three to five years.

Programs are delivered by a broad set of partners, not just by upper secondary schools.

Providing career-focused learning involves a broad set of partners not only in planning but also in delivering programs. Partners include secondary education institutions, postsecondary institutions, and industry and employer partners. It is a delivery system more typical of the U.S. postsecondary sector than our secondary one.

Examples

- In Denmark, students attend upper secondary schools or adult learning centers for university and professional school preparation programs. They attend commercial and technical colleges for professional preparation programs and for classroom instruction related to apprenticeships. Technical and commercial colleges also serve adults and offer higher level professional and technical education. Apprentices spend the majority of their time learning in the workplace.
- Singapore students enroll in junior colleges, which are dedicated upper secondary institutions, for university preparation. If they choose a workplace preparation route, they attend the Institute for Technical Education (ITE), which provides technical education at all levels for 16–19 year olds as well as for adults. Students can also choose to go directly to a polytechnic institute. Students in both ITE and polytechnic programs spend significant time learning in workplaces.
- In Hong Kong, students stay in senior secondary schools to complete university preparation in what is often called sixth form. Students who prefer an initial vocational certificate or diploma program can leave after junior secondary at the end of 9th grade and attend the Youth College or a set of specialized institutions such as the Chinese Culinary Institute or the Maritime Services Institute.

Korea's Meister High Schools are operated in partnership with leading-edge industries. They offer project based learning in different industry areas, with extensive work placements. Students are guaranteed employment in that industry upon graduation, with an agreement to work for at least three years. Korea created a set of new Meister High Schools in semiconductor and digital fields in 2023.

Partners create common industry credentialing systems which set the stage for continuous career advancement.

Upper secondary workforce preparation programs are part of the larger lifelong learning system. As such, these programs provide students with industry credentials that are part of a common credentialing system across industries and across upper secondary and adult learning. Students can stack credentials as they gain more skills, building on what they have already earned. Industry credentials are widely-valued and recognized, and they provide clear opportunities for continuous career advancement across a lifetime of work.

Examples

- Singapore has a Workforce Skills Qualifications system with six levels of qualifications in over 100 vocations in 35 industry sectors. Upper secondary students work toward three levels of certificates (certificate, higher certificate, and advanced certificate) and three levels of diplomas (diploma, specialist diploma, and graduate diploma).
- In Switzerland, the federal government oversees diplomas and certificates in 200+ occupations that students across the country work toward in apprenticeships. With these, students can move on to the workplace or earn more advanced certifications or degrees in each field.
- In Finland, industry credentials are organized at three levels: initial, further, and specialist. These are offered in broad vocational areas like Technology and Health and Welfare—there are 43 initial, 65 further, and 56 specialist qualifications.
- Ireland has a National Framework of Qualifications system that includes academic and vocational qualifications. At each of 10 levels, it shows the school and vocational awards that are offered and describes what they qualify a candidate to do. There are six levels of skills certificates, including an advanced one, and academic and technical degrees and diplomas at levels seven to 10.
- Indiana has organized career pathways within industry clusters across the state and within each mapped out high school, two-year and four-year degree certifications for high growth jobs in each. High school certifications include Veterinary Tech, Horticultural Supervisor, Tax Preparer, Fitness Trainer, Web Developer.

Credential Engine is mapping out all U.S. credentials in a common format in an attempt to better align them, make them transparent to students and employers, and give them the information they need to make good decisions

Probing questions:

- How do the systems highlighted ensure that upper secondary programming is connected to evolving workplace and industry needs? What is there to learn from their approaches?
- Are there benefits to offering a range of providers for upper secondary education? How is the learning experience for upper secondary students different? What state policies might have to change to do this?
- How are skills credentialing systems different in the systems highlighted? Do students in your school or district have clear pathways defined? Are there lessons that can be learned from these systems?

Notes

THINKING DIFFERENTLY ABOUT Teachers

A striking feature of upper secondary programs in leading systems is the variety of types of instructors across programs. With a broad array of partners delivering instruction, teachers in different programs have very different backgrounds, preparation, and professional learning. Students in some programs spend significant time with non-traditional teachers, even more impactful as core subjects are often incorporated into professional and workplace learning.

Thought-provoking observations and interesting examples:

Upper secondary university preparation teachers have strong content expertise.

Teachers in university preparation programs have a degree in their subject with teaching certifications which sometimes require a master's degree. Like teachers in primary and lower secondary grades in many leading systems, they have significant time in their schedules for planning, professional learning, and collaborative time with their peers

Examples

- Estonia, upper secondary teachers have a master's degree, with a bachelor's degree in a subject they will teach. Teachers have a full year induction with a reduced teaching load. They are assigned a teaching mentor, but also meet with their teacher preparation cohort to reflect on their experiences and learn from each other. Schools organize school-wide professional learning sessions but also encourage teachers to meet independently in grade or subject groups to plan collaborative projects or address issues of practice across their grade or subjects.
- In Korea, teaching is a highly-competitive profession. High school teachers complete a bachelor's degree in teaching with a subject specialization or enroll in a master's degree program after a subject-based bachelor's degree. Teachers must pass a very rigorous exam before they are certified to teach. Once they pass, new teachers have reduced hours for three years; during this induction period they are assigned a mentor and participate in professional development tailored for new teachers. They take a second exam after this conditional period, which includes a teaching demonstration, to be fully certified. The Ministry of Education releases an annual plan for

teacher professional development and provincial education offices develop training which is often led by master teachers, based on this guidance. Teachers are required to participate in 60 hours of professional learning each year and to visit each other's classrooms and provide feedback. Master teachers are designated in each school and make their classroom available for other teachers to observe.

Given the long-standing shortage of secondary teachers in Estonia, there are accelerated routes for second career candidates that involve a portfolio assessment of a content area with a streamlined teaching practicum. Preparation programs have also recently shifted to requiring upper secondary teachers to specialize in two subjects rather than one, to allow for flexibility in scheduling in schools and to better prepare teachers to integrate subjects.

Sample of Teaching Hours for Upper Secondary General School Teachers

	Per Year	Per Day
Estonia	654	~4
Finland	561	~3
Korea	539	~3
Switzerland	638	~3.5
United States	888	~5

Source: OECD, Education at a Glance, 2024, Indicator D4 1.4

Vocational subjects are taught by industry specialists, many of whom continue to work part-time in their industry.

These instructors have teaching certification, but these are often short courses or an apprenticeship-style on-the-job training. Professional learning is focused primarily on staying current with changes in the industry.

Examples

- In Singapore, students who enroll in industry certificate programs at the Institute for Technical Education (ITE) are taught by instructors with a minimum of three years of industry experience. The ITE created its own training programs for instructors without teaching credentials, which they complete during their first year. This involves a reduced teaching load, working with a mentor teacher for all teaching responsibilities until they are credentialed, and taking a set of short modules throughout the year. All instructors have time for professional development, which is focused on their specialized area. ITE has different schools (School of Design and Media; School of Electronics and ICT; School of Business and Services), each of which designs its own professional development to best meet the needs of its programs.

- In England, students who attend further education colleges for business and technical education course (BTEC) qualifications or other pre-professional qualifications are taught by instructors with expertise in the profession and further education teaching qualifications, which can be gained by apprenticing with current instructors.
- Virginia has a license for CTE teachers who want to remain in industry and teach part time. They created this to expand the pool of CTE teachers with up-to-date industry knowledge.

In Singapore's ITE, there is no longer a specific number of hours of professional learning as, according to an ITE official, "....we do not want teachers to engage in 'proforma' professional learning just to fulfill a requirement." Estonia made a similar decision when it eliminated the requirement for teachers to engage in a specific number of hours of professional learning, as it was thought that schools and teachers should have autonomy to plan what they think is needed.

Apprenticeship supervisors are the primary instructors.

Upper secondary students in workplace preparation programs are often taught for the majority of their time by current workers on the job. These work supervisors are experts in the profession and have experience training new workers at their company.

Examples:

- In Switzerland, students in vocational diploma programs are primarily taught on the job by workplace supervisors. They spend 3 or 4 days each week for 2–4 years on the job, and learn the skills laid out in "training ordinances" in each professional area. Any enterprise taking on an apprenticeship is required to have a certified workplace trainer within the company who oversees instruction of apprentices. Certification requires a short course focused on pedagogy (generally 100 hours). There are upgrade courses available, and larger companies have designated trainers in each department or division who can help train apprentices who often rotate through different areas.
- In Denmark, students in the vocational diploma program spend about half to two-thirds of their three-year programs in workplace apprenticeships. Worksite supervisors are responsible for teaching apprentices vocational skills as well as the embedded academic skills needed to perform these tasks. They are required to have the same certification the apprentices are working toward and have at least five years of work experience. Supervisors are a key part of assessment for the final diploma.
- In Wisconsin, employers offering apprenticeships to high school students are expected to meet with school coordinators to review progress of apprentices in mastering required skills every nine weeks. The work supervisor verifies that the apprentice has met skills requirements before students are certified.

Probing questions:

- What seems different about how teachers are trained and supported in these systems?
- Do any of the differences highlighted here seem like useful things to consider as schools and systems in the United States strive to bring a new generation of teachers into the profession?
- Would there need to be policy changes to allow for any of these strategies in U.S. schools?

Notes

THINKING DIFFERENTLY ABOUT TIME

A Recap

For an in-depth look at how the policies in this brief come to life, explore our case study of high school programs in Solothurn, Switzerland featuring four student journeys.

Thinking Differently about Options

- Students can choose university preparation programs.
- Students can choose professional preparation programs.
- Students can choose workplace preparation (apprenticeship-style) programs.
- Students can change their minds along the way.

Thinking Differently about Choice

- Systems offer guidance and information to support students in making upper secondary program choices.
- Lower secondary systems build in authentic exploration experiences to help students make informed choices.
- Students can add a transition year to prepare for making upper secondary choices.

Thinking Differently about Flexibility

- Upper secondary is not a standard number of years.
- Calendars often vary to best meet the needs of each program.
- Subjects are modularized and organized into short courses.
- Time for independent learning is a staple strategy.
- Schools adjust time to fit student needs for support or acceleration.

Thinking Differently about Partnerships

- Partners from economic development and industry work together to guide upper secondary programming.
- Programs are delivered by a broad set of partners, not just by upper secondary schools.
- Partners create common industry credentialing systems and set the stage for continuous career advancement.

Thinking Differently about Teachers

- Upper secondary university preparation teachers have strong content expertise.
- Vocational subjects are taught by industry specialists, many of whom continue to work part-time in industry.
- Apprenticeship supervisors are the primary instructors.

A Final Note

Discover

Design

Deliver

Discover is the first step in the NCEE approach. **Design** follows, with action steps that might include selecting focus areas from what you have discovered and making traction-ready plans for change. **Deliver** is putting your plans in action, adjusting as needed to ensure success.

This paper is about discovery, an important step in the larger journey of making improvements. It's about:

- taking time to explore ideas without worrying about being in decision mode,
- investigating how successful systems use time,
- making thought-provoking observations about policies and practices you find interesting,
- asking interesting *what if* questions based on your observations,
- seeking examples across systems to see how they use time differently, and
- learning more about the broader policy and schooling context that impacts how time is used.

This learning journey approach offers a very practical way for U.S. policy and practice experts to explore new ideas, reconsider their own systems, and learn from colleagues across the globe and at home.

Let's think differently! Together.

More from this series

- Thinking Differently About... Math
- Thinking Differently About... Time, Part 1

Thinking Differently About... Strategic Staffing (coming soon)

More from NCEE

***Anticipating the Future* series**

- Global Models of Career Pathways
- Top Performers Emerge from the Pandemic
- Top Performers Reimagine the Teaching Profession
- Reimagining Assessment

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