Mass customization in schools: strategies Dutch secondary schools pursue to cope with the diversity–efficiency dilemma

Sietske Waslander

Mass customization in schools: strategies Dutch secondary schools pursue to cope with the diversity–efficiency dilemma

Sietske Waslander*

University of Groningen, The Netherlands

Faced with the diversity–efficiency dilemma, private companies apply 'mass customization' strategies to add diversity without adding costs. As schools are urged to become more 'customer oriented' they also face a diversity–efficiency dilemma. This article asks how Dutch secondary schools cope with this dilemma and to what extent they apply 'mass customization' strategies. A careful selection procedure aimed at a maximum variety of school practices resulted in seventeen schools for which case studies were conducted. Data collection included written material, observations and interviews. Analysis of the combined data indicated six dimensions along which schools differentiate their educational offerings. On the basis of emerging patterns of differentiation, four categories of schools were distinguished. These categories appear to be closely linked to organizational strategies pursued by schools. The article concludes that practices adopted by schools to cope with the diversity–efficiency dilemma strongly resemble mass customization strategies applied by companies producing tangible goods. In the final section, the risks and inherent contradictions of these strategies are pointed out. For while government policies and schools seek to put the needs of individual students at the centre, the inevitable diversity–efficiency dilemma may cause many schools to adopt practices students never asked for.

Introduction

Public agencies all over the world are urged to tailor their services to the diverse demands of 'clients' and 'customers'. They are expected to move 'from supply-led towards demand-led' organizations. Often ignored is a basic economic law stating that diversity adds costs. While public agencies are expected to customize and diversify their services, their budgets still presume a certain degree of standardized

*Department of Sociology, University of Groningen, Grote Rozenstraat 31, 9712 TG, Groningen, The Netherlands. Email: s.waslander@rug.nl

practices. Public agencies are thus expected to increase diversity without increasing costs, posing a serious dilemma between diversity and efficiency.

This study focuses on secondary education. For this sector in particular, the need for more diversity is heralded all over the globe (OECD, 2004a). The needs and wishes of students and their parents are believed to be very diverse. Notions about the knowledge society and life-long learning emphasize that all students should be able to develop their talents to the fullest (Green, 2002). Schools are urged to offer 'personalized learning', 'tailor-made education' and 'customized learning' (OECD, 2004a). In the Netherlands, for example, the phrase 'every child is unique, every child counts' turns up in every policy document produced in the last three years. This phrase is then followed by pleas for 'tailor-made education' and more diversity within schools. Diversification of educational offerings has also become one of the criteria the inspectorate uses to assess school quality.

At the same time, school budgets have hardly increased. Expected to increase diversity without increasing costs, the trade-off between diversity and efficiency poses a dilemma for secondary schools. This article asks: what strategies do secondary schools pursue to cope with the diversity–efficiency dilemma? This dilemma is well recognized in sectors such as the automobile and apparel industries. Organizational strategies to cope with this dilemma have been documented under the name of 'mass customization'. The second section of this article provides a brief overview of the literature on mass customization. Section three applies these findings to a theoretical framework, arguing that schools can adopt different strategies to cope with the diversity–efficiency dilemma. The remainder of the article is devoted to an empirical study. The fourth (methodological) section describes the selection and research procedures of seventeen case studies involving Dutch secondary schools. The four main categories of schools emerging from the analyses are presented in section five. As it turns out, the strategies schools adopt strongly resemble those applied by private production companies. The article concludes by pointing out some of the ironies of mass customization in schools.

Mass customization

The diversity–efficiency dilemma is a well-known issue in literature on management, production technology, and marketing in the private sector. Organizational strategies for coping with this dilemma are known as mass customization, 'the mass production of individually customized goods and services' (Pine, 1993, p. 28). Initially, mass customization was introduced as an issue of strategic management. In general, the literature is reasonably consistent about the why of customization. In short, the pre-industrial era produced customized goods on a small scale, and the Industrial Revolution introduced standardized goods and mass production. The advent of post-industrialism has given rise to both the need and the technological capability for the mass production of customized goods and services (e.g. Piore & Sabel, 1984; Davis, 1987; Pine & Gilmore, 1999; Bardakci & Whitelock, 2004).

More recently, scholars have begun to address the operational questions associated with the how of mass customization (e.g. MacCarthy *et al.*, 2003; McCarthy, 2004). The first attempts are descriptive and endeavour to develop typologies. Two perspectives can be distinguished in these efforts. The first stems from the perspective of production processes and builds on the idea of a value chain. Lampel and Mintzberg (1996) come up with a typology of five strategies, which vary from pure standardization to pure customization. Others have developed typologies consisting of three (Alford *et al.*, 2000), four (Duray *et al.*, 2000), five (Ross, 1996), or eight (Da Silveira *et al.*, 2001) categories. In order for a production process to result in the differentiation of the final product, it is not necessary that all phases of the production process—ranging from design through manufacturing and assembly to distribution—encompass differentiation. For example, the production of Apple's I-pod is highly standardized, even though these products enable consumers to personalize their purchases to their own requirements. Other products can be decomposed into standardized modules, so that mixing and matching offers the possibility of highly differentiated end products. Furniture companies such as IKEA and Lundia make maximum use of this option. The point in the production process at which differentiation must be incorporated in order to produce differentiated end products is known as the decoupling point. The earlier this decoupling point is placed in the production process, the larger the consequences of customization for the production process. Another important notion is that of cooperation in the value chain, especially with regard to modularity (Mikkola & Skjøtt-Larsen, 2004). When modules produced by one company are combined with those of another company earlier or further on in the value chain, the amount of product differentiation throughout the entire chain increases exponentially.

The second perspective emanates from a marketing perspective (e.g. McKenna, 1988). Gilmore and Pine's (1997; Pine & Gilmore, 1999) 'four faces of mass customization' is built on two dimensions. The first refers to the level of customer involvement, distinguishing cases of active and passive customers. The second dimension refers to the product itself, which may or may not be customized. Notably, they separate characteristics of the product from its representation. Customization then becomes as much a matter of marketing as a matter of producing customized products. Product variety is not always necessary in order to give customers the idea of customization.

Apart from typologies that originate from a conceptual base, empirically derived classifications of mass customization have also emerged. Based on 250 practical cases, Piller and Stotko (2002) deduced two main dimensions that underlie various company strategies for mass customizing their products. The first dimension refers to the extent of customer integration that is required to customize a product or service. The second dimension refers to the degree of 'digitizability', which is the extent to which relevant functions of a product or service 'can be fulfilled by the use of information technology only' (Piller & Stotko, 2002, p. 774). For example, newspapers are comprised completely of information and can therefore be completely digitized. Advances in information technology are believed to bring vastly reduced information

costs, allowing variety to go hand-in-hand with productivity (McCarthy, 2004). For this reason, Pine (1993, p. 48) observed, 'through technology anything that can be digitized, can be customized'. The availability of required (information) technology is often stated as one factor in the success of mass customization (e.g. Da Silveira *et al.*, 2001).

When reviewing the mass-customization literature, three issues emerge. First, the normative connotation of many contributions is striking. Mass customization is presented as a desirable end that should be pushed and promoted. While the literature is replete with success stories, failures that are known to exist are hardly ever mentioned. The few critical arguments that are made can largely be reduced to the following points: realizing the potential of mass customization may be easier said than done; mass customization may have attracted more followers than are justified by the demand for customized goods and services; strategies for decomposing products into standardized modules may involve serious trade-offs (Fleming & Sorenson, 2001; Langlois, 2002). Second, even though the vast majority of empirical research is limited to the production of tangible goods, many authors apply their conclusions to products as well as services (see also Da Silveira *et al.*, 2001). The final issue is more of an irony. While the concept of mass customization is based entirely on consumer needs and wishes, the literature focuses almost exclusively on producers and production technologies. Only recently has empirical research become concerned with consumers. However, this research focuses less on consumer needs than on the issue of 'customer readiness' (Bardakci & Whitelock, 2004; Fiore *et al.*, 2004). Ignoring the demand side of the market is accompanied by a tendency to overlook the consequences of greater product variety for consumers. Increasing search costs and problems of information asymmetry are two well-known and hardly disputed consequences of increased product variety. These drawbacks may outweigh the benefits of more consumer choice (Schwartz, 2004), as 'nobody wants to choose among eighty-seven varieties of steering-wheels' (Lampel & Mintzberg, 1996, p. 24).[1]

A sceptical reading of the literature over the years might be that mass customization is in danger of becoming a self-fulfilling prophecy. What started with an untested notion of vast differences in consumer preferences continued as a new business paradigm involving major changes in operations and production technology, and arrived at the realization that product variety is not always what consumers want. Crafty marketing techniques then become necessary to help sell to consumers what they were supposed to want all along.

Mass customization and education

Advocates of mass customization have also applied this notion to education. As might be expected, literature concerning mass-customized education shares the earlier-noted normative connotation, paints promising pictures and hardly ever mentions the possible disadvantages of mass customization.[2] An elaborate effort to apply the notion of mass customization to education was made in 1997 by a Tokyo-based investment bank as part of a review of higher education and policy in Australia

(Global Alliance Ltd., 1997). It is predicted that technological innovations will yield new opportunities for delivering education to customers 'when they want it, at their own pace, wherever they want' (*ibid.*, p. 11). Moreover, 'mass customization allows the learning offering to be tailored to individual student learning styles, goals, abilities, hopefully leading to an improved outcome' (*ibid.*, p. 11). The 'learning production system' is therefore likely to be 'hollowed out', by which the authors mean that producers and consumers no longer need to be in the same vicinity. The future is clear: 'one size fits all will die. We will enter the era of mass customization of higher education' (*ibid.*, p. 12).[3]

The importance of technology and IT is also stressed by engineering professor Sokolov (2001, p. 195) in an introduction to 'the concept of mass customization in education as a viable alternative to the conventional system'. Noting that 'educational systems follow the concept of production or service organization of their times' (*ibid.*, p. 199), he arrives at the diagnosis that educational systems change too slowly to keep pace. The remedy is clear cut: 'to meet the needs of information-age society and the human self-fulfillment desire, mass education should follow the industrial trend and be converted into mass-customized education' (*ibid.*, p. 200).

The scant literature on mass customization and education contains no references to underlying frictions that the diversity–efficiency dilemma may cause; it consequently ignores possible strategies that schools could use to cope with this dilemma, the conditions that are required for such strategies, or the possible consequences of these strategies. Authors believe strongly, if often implicitly, that IT and e-learning are capable of resolving the diversity–efficiency dilemma (see also Freund, 2003; Philips *et al.*, 2004).

Organizations, including schools, are subject to the economic law that customization implies diversity, and diversity implies a loss of efficiency. Adding diversity without adding costs thus creates a diversity–efficiency dilemma for schools that is comparable to that faced by private companies when customizing products. Although the nature of a school organization is indeed very different from that of a private production company, strategies for coping with such dilemmas are likely to bear resemblance.

The body of research on mass customization shows a wide variety of organizational strategies. Our analysis therefore begins by deriving organizational strategies from the mass-customization literature and translating them into possible use by secondary schools. The empirical analysis is then to identify and to clarify which strategies secondary schools do and do not pursue.

The literature on mass customization suggests that schools may pursue any of the following six known strategies for coping with the diversity–efficiency dilemma.

1. Cosmetic customization

Products themselves do not always need to be customized in order to meet the various needs and wishes of consumers (Gilmore & Pine, 1997). Building an image of customization can sometimes satisfy consumers sufficiently. Although approaching

the issue from very different angles, Lubienski (2006) and Oplatka (2004) arrive at similar conclusions for schools that compete for students. These authors suggest that, for reasons of cost-effectiveness and institutional constraints, schools opt for cosmetic rather than substantive changes. Schools that adopt the strategy of cosmetic customization do not change their school practices, choosing to invest their efforts in marketing instead.

2. Postponing the decoupling point

The notion of a decoupling point is crucial to the value-chain perspective (Mikkola & Skjøtt-Larsen, 2004). The earlier that diversity must be built into the production process, the greater will be the impact of such diversity on the organization, and the larger the risks and potential costs involved. In terms of strategy, postponing the decoupling point is the best way to minimize the organizational consequences of diversity. One way of doing this is to offer standardized products that offer customers the opportunity to customize the product to their own tastes. When postponement to the customer is not possible, products might be decomposed into standardized modules, allowing customers to mix and match freely. In education, schools that choose to pursue this strategy are likely to capitalize on modularization. They may offer a range of modules, which in themselves are standardized, thus requiring students to take an active role in mixing and matching modules, navigating through the curriculum individually.

3. Collaborations and combinations

The option of cooperating with other organizations in order to offer even more opportunities for mixing and matching modules builds on the aforementioned strategy. In the context of education, this strategy suggests that secondary schools may collaborate with community colleges, universities, or other institutions of higher education. In order to distinguish various types of collaborations, only those that are specifically aimed at expanding diversity in educational supply qualify as part of such strategies.

4. Reducing heterogeneity

Mass customization rests on the assumption that consumer preferences are so heterogeneous as to demand diversity in products and services. Logically, the diversity–efficiency dilemma can be avoided by removing the need to diversify. One strategy that may be applied by single suppliers is to reduce the heterogeneity of preferences. A school may apply this strategy by building a distinct profile in the hope of attracting students and parents who comply with their vision. Educational research provides examples of this strategy as well. Fiske and Ladd (2000), for example, observe that the introduction of market forces in New Zealand has increased the number of 'theme schools'. Another way of reducing heterogeneity is simply to select a homogeneous group of students.

5. Adding resources

Because diversity increases costs, the issue of how much customers are willing to pay for a customized product is of crucial importance. Higher prices can enlarge resources for companies, thus somewhat mitigating the need to minimize efficiency loss. Publicly funded secondary schools usually have little opportunity to require students and parents to pay more. They can, however, attempt to add resources to their budget through such strategies as seeking private sponsors.

6. Digitizing learning material (e-learning)

Pine (1993) claims that anything that can be digitized can be customized. As modern technology may minimize information costs, diversity is believed to involve few additional costs. Applying technology may thus allow students the option of working within specific content areas whenever and wherever they wish. The fact that all the authors who link mass customization to education do so with reference to e-learning is consistent with this idea. In terms of strategy, schools are expected to digitize their learning material as much as possible, in order to enable more diversity in learning.

Methodology

The empirical study reported here is set in secondary schools in the Netherlands. Contextual information on the Dutch education system can be found elsewhere (Dijkstra & Dronkers, 2001; Dijkstra *et al.*, 2004). Two features, however, are of special relevance to this study, the first of which is the tradition of publicly funded private schools. In combination with free school choice, this policy has resulted in a wide variety of schools according to religion and pedagogical visions. Although the number of privately funded schools is currently rising, the proportion of secondary students who attend such schools is still less than five per cent (De Regt & Weenink, 2005). A second distinctive feature is a strong history of tracking, particularly in secondary schools (Ministry of Education and Science, 1989). In addition to tracks for students with special needs, there are currently six different tracks in secondary education. They range from the lowest (four-year) track of basic vocational education to the highest (six-year) track of pre-university education.[4] Because not all schools offer all tracks, international comparisons consistently show relatively low within-school variance and relatively high between-school variance in student performance in the Netherlands (e.g. OECD, 2004b, p. 162). Therefore, if Dutch schools catering for a relatively homogenous student population face a serious diversity–efficiency dilemma, schools elsewhere probably encounter an even worse dilemma.

Selection of cases

This study aims to identify strategies that schools adopt in order to cope with the diversity–efficiency dilemma. It is therefore necessary to consider a range of schools

that represent the widest possible variety of school practices. To achieve this goal, a new pragmatic yet creative method of case selection was developed for this research. Based on statistics, empirical research, and information from the inspectorate, a lively portrait of an imaginary average Dutch secondary school was composed. This average school was given the name of Aver College and set in Middletown. The portrait was then distributed among fifty educational experts.[5] They were asked to name schools that were clearly different from Aver College and list the reasons why they felt that any school mentioned should be included in the study. We also searched on the Internet and reviewed newspapers, periodicals and journals in order to identify schools that clearly differed from Aver College. For the thus selected schools, we obtained additional information from websites, school magazines and assessment reports of the inspectorate. Schools that did not differ sufficiently from Aver College were excluded from further consideration, as were schools for which insufficient information was available to make an appropriate judgement. The selection was therefore based on much more information than was available in promotional materials provided by schools. For this reason, schools that merely adopted the strategy of 'cosmetic customization' did not survive this selection procedure.

When composing the initial sample population, three exclusion criteria were applied. First, all home-schooling initiatives were excluded.[6] A second category of schools that was excluded from the study involved 'practical schools' (*praktijkscholen*), which serve special-needs students. The third exclusion criterion was too little deviation from Aver College. Several schools were put forward because of innovative projects that addressed either specific fields of study (e.g. culture education or the sciences), specific groups of students, or new extracurricular options. These initiatives only affect a limited part of the school organization, while most parts are very similar to Aver College. As we wanted to focus on strategies for coping with the diversity–efficiency dilemma, we expected to learn most from schools that are bound to face this dilemma in the entire organization.

This selection procedure resulted in an initial sample of 53 schools. The criterion of maximum variation guided the reduction of this list to 20 appropriate cases. Limiting the selection to current practices, however, may have led us to underestimate variety. New plans may reflect novel coping strategies that schools use. For this reason, we included two schemes that had not yet been implemented, but were soon to be put into practice. As before, these schemes were selected for their distinct features in comparison to the schools that we had already chosen. We thus opted for a list of 22 schools that appeared to be all over the country with a balance for the different tracks. Because not all of these schools were able or willing to cooperate in the investigation, 17 case studies were successfully conducted.

Analysis

Each case study consisted of an analysis of written material, a school visit made by a team of two researchers, and interviews with people who were directly involved in the changes that had taken place (often school principals, project managers, or both).

Written materials provided the basic information of the schools, such as student numbers and the tracks schools offered. The school visits provided information on characteristics of the premises, in particular features enabling different activities of students taking place simultaneously. The interviews were semi-structured, using a topic list with three main themes. The first theme was concerned with reasons for the school to organize itself the way it had. Only when respondents did not mention issues related to 'customization' or 'tailor-made education' spontaneously were these issues raised by the interviewer. The second theme included topics related to possible ways schools may offer diversity to students. Factual information on these issues was gathered from written materials such as timetables. During the interviews we tried to find out within which margins students were able to make choices. The last theme focused on testing and examination, wondering how schools trying to offer diversity deal with standardized national examinations. Interviews were held with 22 respondents, each lasting between one and three hours. Researchers made reports of the interviews, which were then sent to respondents for correction and further comments.

After several attempts to cluster the collected information, six distinct dimensions of diversification in schools were identified. The first dimension refers to the *goals*, ranging from similar goals for all students within a given track, to different goals for every single student. A second dimension refers to *content*, ranging from all students taking exactly the same courses, to students choosing what they want to learn, irrespective of the track or programme they follow. The third dimension has to do with *pace of learning*, ranging from all students needing to complete tasks within a given timeframe, to students working entirely at their own pace, irrespective of their age or year group. The use of *learning materials* is the fourth dimension, ranging from all students working with the same material, to different students using different materials—for example, a book for student A and a computer for student B. The fifth dimension of diversification involves *learning activities*, ranging from all students engaged in the same learning activities at any one time, to different students being involved in different activities simultaneously. In this last case some students may work alone, while others work in small groups, while still others attend lectures in large groups. The last dimension refers to *timetables*, discerning tightly ordered school days from regimes that allow students great freedom to choose when they want to start, finish or have a break. Housing characteristics were not listed as a separate dimension, since they refer to necessary conditions for the above-mentioned school practices.

All schools were rated on these six dimensions. We used three categories for each dimension, ranging from high via middle to low amount of differentiation. Coding was based as much as possible on actual practices, rather than on what schools hoped to achieve. Four distinct patterns of differentiation emerged from this analysis, clustering four types of schools. An overview of the 17 schools with their place in this typology and their scores on the underlying dimensions is given in the Appendix. To ensure confidentiality, all schools were named after distinguished Dutch philosophers and scientists.

As a last step, we set out to find clues about the conditions that might account for the strategies. For this analysis, we drew upon contextual information on the schools, such as school size, different tracks offered, characteristics of the school board, and indications of the reputation of the school.

Findings

When asked for reasons to organize the school the way they did, every single respondent mentioned a similar issue, without any prompting. That issue is student motivation, or more specifically, the motivation of students for lessons at school. Respondents perceived a mismatch between the teaching they used to offer and the wishes and needs of present-day students. This mismatch was believed to have as much to do with content as with teaching methods. With regard to content, several schools were of the opinion that the curriculum they used to offer was outdated. Contemporary students are believed to be less in need of (rapidly aging) knowledge-as-such than they are of such competencies as learning-to-learn. Several respondents further state that they have become part of an 'attention competition'; they must compete with a wide variety of other interesting youth activities. The perceived mismatch raises fundamental questions for schools. If students don't do what teachers think that they should do, a school is likely to fail at its primary objective, which is to ensure that students learn. Schools therefore felt a need to shift from, in their own words, supply-led practices toward demand-led practices, from standardization toward diversification, and from one-programme-fits-all toward tailor-made education and individual learning pathways. The interviews thus support the notion that schools feel the need to customize education.

The four patterns of differentiation that emerged from the analysis refer to the amount of diversity schools offer their students. The four categories of schools can therefore be seen as occupying different points along a continuum. At one end of this continuum we find the *Guards*, offering hardly any diversity. At the other extreme we find the *Radical Customizers*, offering the most diversity. In the middle we find two categories of schools that differ not so much in the amount of diversity they offer as in the way they do so. *Differentiators* capitalize on differentiation of content and pace, while *Economizers* try to offer differentiation by means of diversifying learning materials and learning activities. As the descriptions of these four types of schools will demonstrate, the pattern of differentiation is closely linked to the strategy these schools adopt to cope with the diversity–efficiency dilemma.

Guards

Guards score low on all six dimensions of diversity. Erasmus College may serve as a prime example. The school offers only the highest track (Gymnasium) and is relatively small with approximately 550 students and no intention to grow. Over the past few years, the school received several critical inspection reports, as it had not sufficiently complied with criteria of the inspection framework such as 'active learning'

and offering 'choice options'. By 2004, Erasmus College introduced an elaborate system of mentoring to provide students with more individual attention and to make education a more personal experience. Erasmus College has guarded its traditions against the tides of time, such as major policy changes and changing inspection frameworks. The school adapts to increasing pressures to customize education by adding something to existing practices, thereby not so much customizing education, but personalizing contacts with students. These changes involve only marginal adaptations to daily practices.

The strategy Erasmus College pursues boils down to *reducing heterogeneity*. The college manages to get around the diversity–efficiency dilemma by guarding itself against diversity and maintaining a relatively homogeneous student body. It can hold on to this strategy by the fact that the school is fairly small, offers only the highest track, and is able to select students.

Radical Customizers

At the other end of the continuum, we find schools that score high on all dimensions of diversity. These Radical Customizers take individual wishes and needs of their pupils as a starting point for everything they do. Inspired by the famous Sudbury Valley School, Gomarus College was co-founded by a celebrated marketing director who managed to attract both media coverage and business sponsors. The school adopted the basic principle that every pupil has the right to decide what to learn, how to learn, with whom, when, and where. No distinction is made between primary and secondary school, or between age groups. Gomarus College has neither a set curriculum nor a school plan that outlines how the national framework is implemented, which is the main reason they do not qualify for public funding. The school acquires funds from parents, business sponsors and other donations. At the time of the study, Gomarus College had 35 pupils, and expected its roll would increase to 50 in the following school year. Tuition was €200 per child per month, covering learning materials and housing. The 11 permanent guides all work as volunteers, in addition to other volunteers, who serve as substitutes on a less regular basis. All students have their own implicit or explicit learning objectives, and work at their own pace on topics of their choice, with or without other students, with or without guidance, at times they choose. Students need to be present at certain hours of the day, but can choose for themselves when they want to do schoolwork, play or take breaks. Gansfort College offers a similar amount of diversity but within given timeslots for certain activities. Both schools can be said to offer the ultimate in tailor-made education. Both schools are small (fewer than 60 students), and this small size is an indivisible part of the educational visions to which the schools adhere.

Much like the Guards, these Radical Customizers manage to escape the diversity–efficiency dilemma. But whereas Guards reduce the need to diversify, Radical Customizers restrain the need for efficiency. The main strategy these schools adopt is to *add resources*. Gansfort College attracts additional public funding by virtue of its

student body, which consists mainly of (potential) dropouts. Gomarus College adds various types of resources, including money, in-kind donations from private businesses, and the voluntary work of its guides.

Differentiators

The two other categories of schools are unable to get around the diversity–efficiency dilemma and face the dilemma in its most severe form. These schools are in search of new ways to organize learning for large and heterogeneous groups of students. Although differentiation as such is nothing new, Differentiators currently appear to be pushing differentiation beyond traditional organizational borders.

The most common way to differentiate in educational institutions is probably to decompose the curriculum into standardized modules. Compulsory modules can then be combined easily with modules from which students are allowed to choose. This organizational model has become known as the 'Shopping Mall High School' (Powell *et al.*, 1985). Until very recently, Dutch secondary students were prohibited from simultaneously combining courses that were assigned to different years of study or different tracks. For this reason, the level of differentiation that schools can offer students is limited by the boundaries of year-groups and tracks. Fairly common is what Eisinga College offers students: given a set of tasks to be completed in a two-week period, students can decide for themselves when and what to do. Tinbergen College adopts another version of modularization. Students attending the 'gymnasium plus' take their regular classes during the morning; during the afternoon, they are completely free to work on projects of their choice, under supervision. Tinbergen College modularizes the school day, so to speak, such that a compulsory first half of the day can be combined with a free second half of the day. In this way, the school adds diversity with minimal changes to the organization.

Some schools go further and try to overcome the rigid distinction between year-groups and tracks. A student at Thorbecke College can now be placed in one track, while simultaneously taking courses in another, higher track. De Groot College is slowly moving toward a school organization that has neither year-groups nor tracks. Its goal is to enable a student to take one subject in a certain year at a certain level, another subject in the same year but at a different level, and yet another subject in a completely different year and level. Both schools offer several tracks; modularization across the whole school thus offers a wide range of new combinations for serving the wants of individual students.

Modularization across year-groups and tracks is only one step removed from modularization beyond the boundaries of a school's own organization. Both Lorentz and Leeghwater colleges have sought close cooperation with schools that are, so to speak, further along in the education chain. Each school collaborates closely with a regional education centre for vocational education with the aim of offering students more choices. Students can combine courses offered by their secondary schools with courses offered by the institute for further training. It is believed that by making such combinations, learning pathways can be reduced by one whole school year. Since

these initiatives have only recently been implemented, it is too early to tell whether this aim will be achieved.

In terms of the mass-customization framework, all of these varieties of modularization are examples of *postponing the decoupling point.* Schools offer many different modules, which themselves are standardized so that efficiency is achieved, but which can be combined into vast numbers of different learning pathways. Students become 'active customers' in the process. In these schools it is largely up to students to mix and match the modules into a coherent curriculum. Asked why these schools are organized this way, respondents emphasize that they hope to motivate and activate students by offering them more choices and giving them responsibility for their own learning.

Economizers

The last category of schools scores low on diversifying goals and content, but high on diversifying learning materials and learning activities. Such schools do so by *enlarging the unit of organization.* The usual unit of organization in schools is one teacher, teaching one subject in one hour to a group of 20 to 30 students. Five schools in this study have enlarged this unit of organization, and now work with teams of teachers and groups of up to 150 students. Enlarging the unit of organization offers economies of scale, which can be utilized to offer students more diversity. Three teachers working with a group of 90 students can offer more diversity at any given time than can three teachers, each of whom works with three separate groups of 30 students. A critical condition for this kind of up-scaling is having access to a building that can accommodate both large-group lectures and small-group assignment work sessions, along with individual students working with or without tutors. The five schools that pursue this strategy have all recently made major conversions, entered new buildings, or added new space to existing buildings. Lorentz and Zernike colleges were able to make major conversions to their buildings due to very specific circumstances, which had partly to do with their position of being the single school in a relatively deprived area. Their need for new buildings was then subsidised by government agencies.

Three schools enlarged the unit of organization most rigorously. These three schools are Bernoulli, Boerhaave, and Buys Ballot colleges. Notably, the three colleges share contextual characteristics that distinguish them from the other schools in our research. All three are part of a relatively large private school board and all three schools started almost from scratch. New buildings were designed in accordance with the educational visions of the new schools, a new team of teaching staff was hired, new learning materials were developed and students—or their parents—deliberately chose the school. Teaching staff not only includes fully qualified teachers, but also teaching assistants and tutors. Students in these schools attend common compulsory lectures where themes are introduced. Subsequently they can choose how, when, and with whom they wish to elaborate the theme.

As such, *enlarging the unit of organization* does not resemble any of the six strategies derived from the mass-customization literature. However, the practices these schools

adopt are applications of two economic concepts related to increased efficiency: economies of scale and economies of scope. Economies of scale refer to the advantages of mass production: the costs per unit of a product decrease when more units of that product are produced. Economies of scope refer to efficiency gains across different products, meaning that a company can produce product A cheaper when it also produces product B.

A full understanding of economizers can only be gained by acknowledging the role of the school boards. Only large school boards have the monetary flexibility to start a new school from scratch, to invest in new expensive buildings, or to diversify educational services across schools. It is no surprise, then, that each of the school boards involved in this strategy covers a large geographical area and often approaches the status of local monopoly. In an attempt to offer all students in a certain region the opportunity to receive a suitable education, these boards diversified their services in an attempt to cater to all tastes. The total number of clients of these boards is fairly stable: students and parents not opting for the new school will most likely attend another school of the same board. Thus, the schools that pursued the strategy of enlarging the unit of organization most rigorously did so in an environment protecting them from strong competition. They were in a position to take risks.

Conclusions and discussion

Dutch secondary schools are urged to focus on the diverse needs and wishes of their customers. In the absence of additional funds, schools face a serious diversity–efficiency dilemma. This study asks what strategies schools pursue to cope with this dilemma. Literature on mass customization was drawn on to derive six possible organizational strategies. The empirical question then is whether, and if so how and to what extent, strategies pursued by schools resemble strategies pursued by private production companies.

The first conclusion is that the diversity–efficiency dilemma was present in all 17 schools included in this study. Based on six dimensions referring to ways schools might offer diversity, four patterns of school practices were identified. The four corresponding categories of schools were named Guards, Differentiators, Economizers and Radical Customizers. Schools within the same category tend to pursue similar strategies, which differ from those in other categories. These strategies strongly resemble those derived from the mass-customization literature. Only one of the strategies derived from the literature did not emerge in our analysis: *digitizing learning material*. Although the schools in this study do use IT in both learning and administration, the case studies do not indicate that the use of IT alone is a strategy that is capable of coping with the diversity–efficiency dilemma. These results are in line with other educational research (Cuban, 2001; Conlon & Simpson, 2003).

These conclusions raise many issues, only three of which we will start to address in this final section. First, although the study was not designed to investigate systematically relations between strategies and conditions, some patterns seem to emerge. If

these patterns hold true in future research, many schools are bound to turn into Differentiators and adopt the strategy of modularization. Second, coping with a dilemma implies that trade-offs must be made. Trade-offs involved in the diversity–efficiency dilemma might point to those between proficiency level and student alienation. Third, the results of this study indicate that contemporary educational policy is at risk of turning into a major irony, if not tragedy.

Strategies and conditions

Analysis of the case studies starts to illuminate how conditions might be linked to strategies. The main strategy adopted by Guards is to *reduce heterogeneity* of the student body. If, as it appears, reputation and market position are conditions for pursuing this strategy, it will only be a viable option for a selected number of schools. Radical Customizers try to escape the diversity–efficiency dilemma by *adding resources.* The two Radical Customizers in this study are deliberately small and in a sense reflect the severity of the dilemma, indicating that even small schools need substantial additional resources in order to customize education. Unable to escape from the diversity–efficiency dilemma, most schools are to face the dilemma in its most severe form. Differentiators attempt to *postpone the decoupling point* and look for *collaborations and combinations.* The modularization some schools have employed crosses the usual organizational boundaries between tracks and year-groups. Other schools go one step further and collaborate with institutions that are further along in the education chain (see also Hall & Thomas, 2004). If any conditions are vital for this set of strategies, school size and the number of tracks offered are the likely candidates. Economizers apply the strategy of *enlarging the unit of organization*, the educational version of exploiting economies of scale. The three schools adopting this strategy most rigorously share important contextual factors. These schools were part of a large school board and able to utilize economies of scope. At a general level, the two other schools in this category share these characteristics. These schools are also secluded from local competition. It might be that protection from competition and access to appropriate accommodation are necessary conditions for adopting this strategy. If this turns out to be the case, few schools will be able to meet these conditions at short notice. All in all, since the strategy of modularization requires the least strict conditions, many—if not most—schools will turn into Differentiators.

Trade-offs

Decomposing products into standardized modules may involve trade-offs (e.g. Langlois, 2002). The same may apply to modularization of education. With their model of identity and schooling, Akerlof and Kranton (2002) claim that schools with diverse populations have essentially two options. The first is to promote a single ideal and offer little choice. One disadvantage of this option, however, is that many students will not be able to identify with the school and will not be engaged in their schooling. The second option is to adopt a model that resembles the Shopping Mall

High School and offer students more choice. Although this option will engage more students, they are unlikely to develop a strong identity and some students will acquire fewer skills. Succinctly put, the trade-off involved with modularization might be between proficiency levels and student alienation.

Ironies

The few studies on the mass customization of services suggest that service organizations apply distinct strategies, which capitalize on customer relations (Hart, 1995). Wind (2001) distinguishes between the customization of goods and the *customerization* of services. While the former involves changes in operations and technology, the latter primarily involves the redefinition of customer relations. People are believed to value personal attention and a sense of control more than they value choices, particularly where services are concerned. The extensive mentoring system set up by Erasmus College might be the prime example of an appropriate customerization strategy. Many of the professionals we interviewed, from all types of schools, put forward that what students value most is 'to be(come) somebody' and be known by staff. The fact that schools adopt strategies that resemble those of the customization of goods, however, threatens to be at odds with this insight.

The analogy between mass customization of goods and education can be drawn even further. From the literature we learned that companies offer their consumers options they do not always want. As argued above, many schools are likely to respond to the diversity–efficiency dilemma by modularizing education and giving students the options to build coherent curricula for themselves. It may well be that students, like consumers of services, want personal attention and advice. Students may therefore, like customers of firms, end up paying the bill for something they never asked for. Mass customization in schools may thus turn into a curious, if not bitter irony.

Acknowledgements

Notes

1. Not everybody is convinced by research outcomes that suggest that customer preferences may differ less then expected. Most often, maximizing consumer satisfaction is considered the 'ultimate expression of being customer-driven' (Bardakci & Whitelock, 2004, p. 1397). Nonetheless, consumers tend to be satisfied when their expectations are met. This is problematic, as expectations may already be contaminated by what suppliers can and cannot offer. Another criterion has therefore been introduced—the 'sacrifice gap', referring to the gap between what a company has to offer and what each customer 'truly desires' (Hart, 1995).

2. More attempts were made in comparable directions, without explicit references to the mass-customization framework (e.g. Ausburn, 2002; Prince, 2002).

3. The concept of mass-customized education seems to have taken some root in Australia. In an action plan intended to stimulate initiatives for learning in the knowledge society, the Vocational Education and Training sector is called upon to 'use the tools of the new economy' and 'to move away from the old industrial mass-production approaches to teaching and learning, to offer convenient and customized products and services to an expanded national and international customer base' (Australian National Training Authority, 2000). The paper foresees 'fast changing work practices and preferences', such that skills must be developed on a 'just-in-time' and 'just-for-me basis'. Also from Australia is UniSAnet, the computer network of the University of South Australia, of which 'one of the guiding principles … is the idea of "mass customization"' (Weight *et al.*, 2001).

4. These tracks, from low to high, are: VMBO (preparatory middle vocational education)–basic vocational (4 years); VMBO–staff vocational (4 years); VMBO–mixed (4 years); VMBO–theoretical (4 years); HAVO (higher general education)–general (5 years); VWO (preparatory university education) (6 years), sometimes divided into an Atheneum track–without classical languages, and a Gymnasium track–with these languages.

5. These experts were members of advisory committees, educational agencies, consultants, or researchers, and all were familiar with various secondary schools.

6. As school attendance rather than schooling is compulsory, no records are available concerning the number of home-schooled students in the Netherlands. The number is currently estimated at a few hundred at most (Blok, 2002). For legal reasons, this number is unlikely to rise in the near future.

Notes on contributor

Sietske Waslander is professor of sociology at the University of Groningen, the Netherlands. She conducted research on the marketization of education in New Zealand and on educational indicators for cross-curricular competencies for the Organisation for Economic Co-operation and Development (OECD). Her current research projects include studies on educational innovation, public private partnerships and downward social mobility.

References

Akerlof, G. A. & Kranton, R. E. (2002) Identity and schooling: some lessons for the economics of education, *Journal of Economic Literature*, 40, 1167–1201.

Alford, D., Sackett, P. & Nelder, G. (2000) Mass customisation: an automotive perspective, *International Journal of Production Economics*, 65, 99–110.

Ausburn, L. J. (2002) The freedom versus focus dilemma in a customized self-directed learning environment: a comparison of the perceptions of adult and younger students, *Community College Journal of Research and Practice*, 26, 225–235.

Australian National Training Authority (2000) *Learning for the knowledge society: an education and training action plan for the information economy*. Available online at: http://www.dest.gov.au/schools/publications/2000/learning.htm (accessed 11 March 2005).

Bardakci, A. & Whitelock, J. (2004) How 'ready' are customers for mass customisation? An exploratory investigation, *European Journal of Marketing*, 38, 1396–1416.

Blok, H. (2002) De effectiviteit van thuisonderwijs: een overzicht van onderzoeksresultaten [The effectiveness of home schooling: a review of research], *Nederlands Tijdschrift voor Onderwijsrecht en Onderwijsbeleid*, 14, 151–163.

Conlon, T. & Simpson, M. (2003) Silicon Valley versus Silicon Glen: the impact of computers upon teaching and learning: a comparative study, *British Journal of Educational Technology,* 34, 137–150.

Cuban, L. (2001) *Oversold and underused: computers in the classroom* (Cambridge, MA, Harvard University Press).

Da Silveira, G., Borenstein, D. & Fogliatto, F. S. (2001) Mass customisation: literature review and research directions, *International Journal of Production Economics,* 72, 1–13.

Davis, S. M. (1987) *Future perfect* (Reading, MA, Addison-Wesley).

De Regt, A. & Weenink, D. (2005) When negotiation fails: private education as a disciplinary strategy, *Journal of Education Policy,* 20, 59–80.

Dijkstra, A. B. & Dronkers, J. (2001) Church, state, and civil society: the Netherland's system of schooling, in: H. D. Meyer & W. L. Boyd (Eds) *Education between state, markets, and civil society, comparative perspectives* (London, Lawrence Erlbaum Associates), 63–80.

Dijkstra, A. B., Dronkers, J. & Karsten, S. (2004) Private schools as public provision for education: school choice and market forces in the Netherlands, in: P. J. Wolf & S. Macedo (Eds) *Educating citizens: international perspectives on civic values and school choice* (Washington, DC, Brookings Institution Press), 67–90.

Duray, R., Ward, P. T., Milligan, G. W. & Berry, W. L. (2000) Approaches to mass customisation: configurations and empirical validation, *Journal of Operations Management,* 18, 605–625.

Fiore, A. M., Lee, S. E. & Kunz, G. (2004) Individual differences, motivations, and willingness to use a mass customization option for fashion products, *European Journal of Marketing,* 7, 835–849.

Fiske, E. B. & Ladd, H. F. (2000) *When schools compete. A cautionary tale* (Washington, DC, Brookings Institution Press).

Fleming, L. & Sorenson, O. (2001) The dangers of modularity, *Harvard Business Review,* 79, 20–21.

Freund, R. J. (2003) Mass customisation and personalization in education and training, paper presented at the *E-learn China Conference,* Edinburgh, 21–23 July.

Gilmore, J. H. & Pine, B. J. II (1997) The four faces of mass customisation, *Harvard Business Review,* 75, 91–101.

Global Alliance Ltd. (1997) *Australian higher education in the era of mass customization, report prepared for the review of higher education and policy.* Appendix 11 available online at: http://www.dest.gov.au/archive/highered/hereview/reports/cpapers.pdf (accessed 11 March 2005).

Green, A. (2002) The many faces of lifelong learning: recent education policy trends in Europe, *Journal of Education Policy,* 17, 611–626.

Hall, D. & Thomas, H. (2004) Teaching university modules in sixth forms: the shifting boundaries of post-compulsory education? *Journal of Education Policy,* 19, 179–193.

Hart, C. W. L. (1995) Mass customisation: conceptual underpinnings, opportunities and limits, *International Journal of Service Industry Management,* 6, 36–45.

Lampel, J. & Mintzberg, H. (1996) Customizing customization, *Sloan Management Review,* 38, 21–30.

Langlois, R. N. (2002) Modularity in technology and organization, *Journal of Economic Behavior and Organization,* 49, 19–37.

Lubienski, C. (2006) School diversification in second-best education markets; international evidence and conflicting theories of change, *Educational Policy,* 20, 323–344.

MacCarthy, B., Brabazon, P. G. & Bramham, J. (2003) Fundamental modes of operation for mass customisation, *International Journal of Production Economics,* 85, 289–304.

McCarthy, I. P. (2004) Special issue editorial: the what, why and how of mass customisation, *Production Planning and Control,* 4, 347–351.

McKenna, R. (1988) Marketing in an age of diversity, *Harvard Business Review,* 66, 88–95.

Mikkola, J. H. & Skjøtt-Larsen, T. (2004) Supply-chain integration: implications for mass customization, modularization and postponement strategies, *Production Planning and Control,* 14, 352–361.

Ministry of Education and Science (1989) *Richness of the uncompleted. Challenges facing Dutch education.* Reviews of national policies for education in the Netherlands, report to OECD (The Hague, State Printing Office).

Oplatka, I. (2004) The characteristics of the school organization and the constraints on market ideology in education: an institutional view, *Journal of Education Policy,* 19, 143–161.

Organisation for Economic Co-operation and Development (OECD) (2004a) *Innovation in the knowledge economy* (Paris, OECD).

Organisation for Economic Co-operation and Development (OECD) (2004b) *Learning for tomorrow's world. First results from Pisa 2003* (Paris, OECD).

Philips, M., Hawkins, R., Lunsford, J. & Sinclear-Pearson, A. (2004) Online student induction: a case study of the use of mass customization techniques, *Open Learning,* 2, 191–202.

Piller, F. T. & Stotko, C. M. (2002) Mass customisation: four approaches to deliver customized products and services with mass production efficiency, in: T. S. Durrani (Ed.) *Proceedings of the IEEE International Engineering Management Conference,* Cambridge University, UK, 18–20 August, 773–778.

Pine, B. J. II (1993) *Mass customisation: the new frontier in business competition* (Boston, MA, Harvard Business School Press).

Pine, B. J. II & Gilmore, J. H. (1999) *The experience economy. Work is theatre and every business a stage* (Boston, MA, Harvard Business School Press).

Piore, M. J. & Sabel, C. F. (1984) *The second industrial divide: possibilities for prosperity* (New York, Basic Books).

Powell, A. G., Farrar, E. & Cohen, D. K. (1985) *The shopping mall high school. Winners and losers in the educational marketplace* (Boston, Houghton Mifflin Company).

Prince, C. (2002) Developments in the market for client-based management education, *Journal of European Industrial Training,* 26, 353–359.

Ross, A. (1996) Selling uniqueness—mass customisation: the new religion for manufacturers? *Manufacturing Engineer,* 75, 260–263.

Schwartz, B. (2004) *The paradox of choice. Why more is less* (New York, HarperCollins Publishers).

Sokolov, M. (2001) Technology's impact on society: the issue of mass-customized education, *Technological Forecasting and Social Change,* 68, 195–206.

Weight, J., Costello, M. & Paasuke, P. (2001) Text and tech: coupling in cyberspace, *Text,* 5. Available online at: http://www.gu.edu.au/school/art/text/ (accessed 3 May 2005).

Wind, J. (2001) The challenge of 'customerization' in financial services, *Communications of the ACM,* 44, 39–44.

Appendix.   Overview of schools, categories, dimensions of differentiation and organizational strategies

Category and School	Goals	Content	Pace of Learning	Learning Materials	Learning Activities	Timetables	Organizational Strategies
Guards							
Erasmus College	Low	Low	Low	Low	Low	Low	Reduce heterogeneity & collaborate and combine
Differentiators							
Thorbecke College	Low	High	High	Low	Low	Low	Postpone decoupling point & collaborate and combine
De Groot College	Low	High	High	Low	Low	Low	Postpone decoupling point & collaborate and combine
Leeghwater College							Postpone decoupling point & collaborate and combine
Huygens College	Low	High	High	Low	Medium	Low	Postpone decoupling point
Eisinga College	Low	Medium	Medium	Low	Medium	Low	Postpone decoupling point
Tinbergen College	Low	Medium	Medium	Low	Medium	Low	Postpone decoupling point
Kamerlingh Onnes College	Low	High	Medium	Low	Low	Low	Postpone decoupling point
Spinoza College	Low	High	Medium	Low	Low	Low	Postpone decoupling point
Van Leeuwenhoek College	Low	High	Medium	Low	Low	Low	Postpone decoupling point
Economizers							
Zernike College	Low	Low	Low	High	High	Medium	Enlarge unit of organization
Lorentz College*	Low	Low	Medium	Medium	Medium	Medium	Enlarge unit of organization & collaborate and combine
Bernoulli College	Low	Low	Medium	High	High	High	Enlarge unit of organization
Boerhaave College	Low	Low	Medium	High	High	High	Enlarge unit of organization
Buys Ballot College*	Low	Low	Medium	High	High	High	Enlarge unit of organization
Radical Customizers							
Gomarus College	High	High	High	High	High	High	Add resources
Gansfort College	High	High	High	Medium	Medium	High	Add resources

* In the planning stage at time of study; to be fully implemented within two years