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Caught in an Epistemic Trap: Why Economic Justifications Fail Design and Technology Education

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Abstract

Design and Technology (D&T) education in England occupies an increasingly precarious position within the school curriculum. In response to declining participation, reduced curriculum time, and policy marginalisation, recent and ongoing advocacy by the D&T Association (D&TA) has sought to secure the subject's future through economic justification. D&T is positioned as essential to national productivity, industrial competitiveness, innovation, and labour market preparedness.

Drawing on Ball's work on performativity and neoliberal policy (2003, 2012), the paper conceptualises economic justification as an 'epistemic trap.' It argues that in seeking legitimacy through economic rationality, D&T accepts a mode of valuation that is expedient, volatile, and misaligned with educational purpose. This not only marginalises the subject's intellectual foundations but accelerates the conditions of its potential decline.

The paper uses critical rhetorical analysis of a D&TA policy-facing advocacy document, whilst using Toulmin's model of argumentation (Magalhaes, 2020) as a methodological framework, examining how economic claims are constructed, supported, and qualified. Particular attention is given to the strength of warrants and backing, the absence of meaningful qualification, and the reliance on industry authority. Using Toulmin's framework, aligned with Ball's (2003) concept of performativity, reveals how policy certa inty, urgency, and measurability shape the argument, whilst Fricker's (2007) work exposes the epistemic injustices that result.

The findings, based on rhetorical analysis, demonstrate that the economic argument relies on weak educational backing, authority substitution, and unqualified claims. This framing produces an epistemic injustice by deflating the credibility of the subject's educational value, by obscuring D&T's distinctive practices. Paradoxically, the more convincingly the subject aligns itself with economic rationality and success, the more it undermines its existing precarity. The paper concludes that long-term sustainability for D&T depends not on economic alignment, but on reclaiming epistemic autonomy and articulating educational value beyond performative metrics.

Key Words: Design and Technology, Epistemic, Economic, Performativity

1 INTRODUCTION

The future of Design and Technology (D&T) education in England remains perilous, with few precedents for a subject experiencing such a rapid rise followed by dramatic threats to its existence (Spendlove, 2022). Since the millennium, D&T examination entries have fallen by approximately 80%, whilst indicators of investment, government prioritisation, and teacher recruitment point toward an uncertain future. In response to these challenges, I have previously advocated for an alternative vision prioritising the intellectual opportunities the subject offers through Design and/or Technology 2.0 (Spendlove, 2017).

Likewise, the Design & Technology Association (D&TA), whose objective is to be 'the authority on developing high quality teaching and learning', have also acknowledged significant concerns. In particular in response the challenges faced, the D&TA's publication 'Reimagining D&T: Our Vision' (2023), which remains as a centrepiece of their homepage (as of January 2026), foregrounds 'The Economic Case' for reimaging the subject, with evocative language claiming we "must act now to transform the subject and save it from almost certain oblivion" (D&TA, 2023, p.1).

This economic prioritisation takes on heightened significance given England's 2025 curriculum and assessment review (DfE, 2025) which offers an opportunity for bold reconceptualising of the subject. However, the D&TA's current position prioritises economic instrumentalism whilst advocating 'rebranding' rather than pursuing emancipatory curriculum reform grounded in ethical responsibility, disciplinary integrity, and social justice. In highlighting the 'economic case' as primary validation, the vision consequently diminishes the subject's intrinsic disciplinary value.

Drawing on Ball's critique of neoliberal policy (2012) and Fricker's concept of epistemic injustice (2007), this paper examines how D&T has fallen into an 'epistemic trap' that ultimately devalues the subject's intellectual contribution whilst legitimising historical alignment with industrial production, labour-market competitiveness, and capitalist utility. This economic validation therefore distorts the curriculum toward visible artefacts, measurable outcomes, and contrived 'problems,' privileging consumption and fabrication over ethical, cultural, or environmental reflection. Such comparable burden of economic justification is not adopted by other school subjects, therefore D&T aligns itself in a position of epistemic injustice (Fricker, 2007) whereby its academic contribution is undervalued, marginalised, and rendered unintelligible within dominant policy discourse. Consequently, a political blind spot emerges where the subject exists within limited instrumentalist rationalities, reduced teacher professionalism, distorted assessment practices, and a destabilised identity (Spendlove, 2024).

In this paper I will therefore argue that the pursuit of externally validated economic legitimacy constitutes an 'epistemic trap' that manifests in seeking credibility through prioritising industrial utility and productivity, whilst inadvertently undermining the intrinsic educational values that

define disciplinary identity. This trap manifests in two interlocking dynamics: first, historical alignment with industrial production frames the subject through logics of growth, consumption, and capitalist utility, distorting curriculum toward fabrication over ethical reasoning, cultural critique, and environmental responsibility; second, because economic validation burdens D&T uniquely, it results in epistemic injustice whereby inherent values become marginalised within policy discourse.

2 METHODOLOGY AND ANALYTICAL FRAMEWORK

This paper employs rhetorical analysis as a qualitative methodology to provide 'interpretation, meaning and illumination' (Usher, 1996, p.18) of the 'economic case' within the D&TA's 'Reimagining D&T: Our Vision'. Rhetorical analysis was chosen as it is particularly useful for examining how policy arguments are constructed, presented, and mobilised to persuade specific audiences.

Aristotle (320 BC) defined rhetoric as the 'ability of observing in any given case the available means of persuasion' (Magalhaes, 2020). This analysis integrates two complementary frameworks. Firstly Aristotle's 'triad' of rhetorical devices (Lutzke & Henggeler, 2009): ethos (credibility), pathos (emotion), and logos (reason), examine the persuasive strategies. Secondly, Toulmin's argument model (Magalhaes, 2020) provides a structure for systematic evaluation of internal coherence and evidential support. These frameworks are theoretically complementary as Aristotelian rhetoric reveals how persuasion is framed and in what ways, whilst Toulmin's model exposes where argumentative structure weakens, collapses, or relies on assumptions.

Toulmin's model identifies six elements: claim (position advanced), data (evidence presented), warrant (logical connection between data and claim), backing (deeper support legitimising warrant), rebuttal (acknowledgement of conditions under which claims might not hold), and qualifier (indicators of claim strength, scope, or conditionality). As Magalhaes (2020, p.2) notes, "rhetoric deals with the realm of the possible, the probable, the plausible, and the verisimilar", therefore analysing these elements reveals not only what is stated but what is implied, assumed, or strategically omitted.

The 'Reimagining D&T' publication comprises ten pages interspersed with images and endorsing quotes. Given this brevity, a comprehensive approach was taken rather than sampling. The text was read multiple times to identify the core economic argument and supporting rhetoric. Initial readings identified explicit claims about economic necessity whilst subsequent reading facilitated systematically mapping statements according to Aristotle's triad and then applied to Toulmin's structure.

Specific instances were selected based on representativeness of broader rhetorical patterns and centrality to the economic case. For example, macroeconomic data (GVA figures, employment statistics) exemplified logos-based reasoning, crisis-framed language ('almost certain oblivion,' 'we must act now') exemplified pathos-driven urgency, whilst industry endorsements were identified as ethos appeals. These were evaluated against Toulmin's framework to determine

whether data adequately supported claims, whether warrants were explicit or implied, and whether backing, qualifiers, and rebuttals were present or absent. Throughout, attention focused on how simplification, aggregation, and urgency are deployed to generate conviction in the absence of robust evidence or substance.

3 RESULTS

3.1 Core Claim and Argumentative Structure

The central claim is that Design and Technology education is economically essential to the UK, and declining provision threatens national prosperity. The implied policy conclusion request Government prioritise D&T through funding, curriculum reform, and teacher incentives. Whilst this may appear reasonable, albeit superficial, the rhetoric relies heavily on association, urgency, and selective economic framing, proving overly simplistic and inadequately supported upon examination.

This economic framing represents an 'epistemic trap', as by grounding legitimacy primarily based on economic utility, the argument marginalises D&T's intrinsic disciplinary knowledge, pedagogical distinctiveness, and epistemic value. As a consequence, a sense of 'epistemic betrayal' occurs through succumbing to the seductive appeal of 'reimagining' D&T as a driver of economic prosperity. Such betrayal inadvertently undermines the foundations that could ultimately sustain curricular standing.

Using Toulmin's framework, the argument maps as follows: Claim - D&T must be prioritised because economically it is essential to UK prosperity. Data - manufacturing, engineering, and design sectors contribute significant GVA (£645 billion), employ large workforce proportions (26% of UK workers), with employers reporting skills shortages and demand for creativity, problem-solving, and technical capability. Warrant (largely implicit) - if economically important sectors require certain skills, school D&T should be strengthened to supply them. Backing (weak and anecdotal) - endorsements from prominent designers, assumed curriculum-labour market alignment, and generalised skills discourse around creativity and innovation. Qualifiers (largely absent)-claims presented as necessary and urgent with minimal conditional language or contextual acknowledgement. Rebuttals (not meaningfully addressed) - potential counterarguments about whether skills shortages reflect labour market rather than educational failures, whether economic priorities may shift, or whether transferable skills are not subject-specific remain unengaged.

3.2 Claim, Data, and Warrant: The Problem of Implied Causation

Within the D&TA's economic case 'claims' are presented in absolutist terms where D&T is characterised as developing skills 'imperative to success in life and work' without specifying conditions or how this is authentically achieved. This approach excludes debate, whilst positioning teachers as acquiescent in accepting 'that a Reimagined D&T would require a rebrand that includes a name change', with 'Design, Engineering and Innovation' foregrounded as the way

forward. From Toulmin's perspective, strong claims require proportionately strong evidence and support, yet the evidence base does not warrant such certainty or conclusions.

Logos (appeals to reason) appears most prominently in macroeconomic data presentation. Large-scale figures such as £645 billion GVA, 26% of workforce demonstrate manufacturing, engineering, and design economy importance. However, this constitutes rhetorical rather than a logical or convincing argument. Aggregating impressive statistics creates a causal impression without establishing actual causal links. The data suffers three critical problems: firstly, it conflates distinct sectors into single economic category, rhetorically aligning them with school-level D&T; secondly, it demonstrates sectoral economic importance but provides no evidence that GCSE or KS3 D&T is necessary or sufficient for their success; thirdly, paradoxically, the existing robustness of these sectors is despite the documented decline of D&T which consequently undermines the educational necessity claims. As such an association fallacy is evident in that data shows tenuous correlation but assumes causation without justification.

The 'warrant', bridging data to justify the claim, is therefore never explicitly stated. Instead, it's implied through rhetorical association by economic data being presented, D&T being mentioned, and readers expected to infer causal production. In Toulmin's terms, warrants must be defensible and relevant. Here, the warrant that 'economically important sectors requiring skills means school D&T should be strengthened' depends on unstated assumptions that school-level D&T is the primary or most effective location for developing the required 'skills'.

In pursuing a narrow economic case, there is little to suggest that the advocated skills aren't equally or better developed elsewhere in curriculum or across the curriculum, or that the skills 'taught' within D&T align with future industry demands. The warrant therefore functions rhetorically, appearing plausible, but lacking analytical substance.

3.3 Backing: Authority Substituting for Evidence

Backing provides deeper support legitimising warrants. The economic case 'backing' is notably weak, taking three problematic forms reinforcing the epistemic trap by positioning external validation as disciplinary coherence. Most significantly, educational-economic causal evidence is absent. The document presents economic data about manufacturing, engineering, and design economy but provides no backing demonstrating how school D&T causally contributes to these outcomes.

Equally absent are any form of longitudinal evidence linking school D&T participation to sectoral entry, productivity, or innovation. Likewise, there is no evidence showing D&T produces economic outcomes more effectively than other subjects or cross-curricular approaches or substantial evidence that KS3 or KS4 curriculum reform alters national skills supply measurably. Without such backing, warrants remain speculative. Economic scale therefore serves as a tenuous proxy for educational impact with rhetorical substitution rather than supporting evidence. Epistemically this is significant as the argument assumes what should be demonstrated, treating school subject-economic outcome connections as self-evident when this requires justification.

Furthermore, the document relies heavily on authority rather than disciplinary knowledge. Prominent designer endorsements provide implicit backing without scrutiny, whilst anonymous, selectively presented teacher statements validate D&T necessity. From Toulmin's perspective, this constitutes weak backing, authority statements don't substitute for disciplinary or empirical justification whilst industry voices validate economic relevance from practitioner perspectives but cannot establish educational necessity or curricular effectiveness.

The reliance on external rather than internal disciplinary authority therefore reinforces the epistemic trap, where the subject's credibility is outsourced to economic actors rather than grounded in its own knowledge base, pedagogy, or educational philosophy. Consequently, epistemic legitimacy is marginalised, overridden and framed by external validation rather than drawing upon disciplinary identity.

3.4 Qualifier: The Absence of Analytic credibility

Qualifiers indicate the strength, scope and conditionality of the claim. As such, the subject associations assertions confirm the ambiguity apparent within the economic argument, notably lacking qualification, creating weaknesses undermining analytical credibility.

Claims are presented as universally true rather than context dependent whilst no acknowledgement appears that economic alignment may have limits, unintended consequences, or detrimental impacts on subject, teachers, and students. Phrases like our subject is strong on the 'human skills' that industry is crying out for from education' lack qualification at analytical credibility's expense. Strong, unqualified claims require strong evidence, yet the evidence base is weak. This absolutist, catastrophic framing leaves little opportunity for justifying the subject on grounds beyond economic utility, further entrenching epistemic marginalisation.

3.5 Rebuttal: The Absence of Counterarguments

In Toulmin's model, rebuttal acknowledges conditions under which claims might not hold, or counterarguments to anticipate and address. To some extent this might be expected when trying to make a convincing case to government, yet the document fails to engage meaningfully with potential rebuttals, resulting in closed rhetoric appearing persuasive only to those already convinced. Such myopia does little for the credibility of the subject and four critical rebuttals remain unaddressed, each fundamentally challenging the economic case and revealing internal contradictions.

Firstly, skills shortages may reflect labour market failures, inadequate wages, poor conditions, insufficient employer training investment, or regional inequality, rather than educational deficiencies. The document doesn't address whether increasing D&T provision would remedy these structural issues or simply produce qualified individuals choosing not to enter sectors offering unappealing conditions. This omission is analytically significant as it assumes educational supply creates labour market demand, ignoring that demand-side factors may be determinative.

Secondly, the document's own skills characterisation creates unaddressed rebuttal. It repeatedly implies D&T uniquely develops creativity, problem-solving, collaboration, adaptability and social emotional skills, described as essential to future economies. Yet given such skills would need to be transferable if they are able to move from the classroom to industry, then what specifically within D&T makes it economically indispensable compared to transferable skills from other subjects? The argument implies simultaneous development of universal skills (transferable across contexts) alongside subject exclusivity (uniquely developed in D&T), a logical contradiction that appears contrived. Engaging this rebuttal would require either demonstrating D&T develops these skills more effectively than alternatives or abandoning exclusivity claims. Failure to address this contradiction is particularly damaging because it undermines the very skills discourse the argument depends upon.

Thirdly, the document's own data provides unaddressed rebuttal. It acknowledges 77% of designers work outside 'design sectors', inadvertently weakening rather than strengthening the economic case. If ‘designers’ are distributed across the economy rather than concentrated in discrete sectors, this suggests design capability develops through multiple educational and professional pathways, not primarily through school D&T. The document doesn't address this tension, treating D&T as primary feeder into all design-related domains whilst simultaneously presenting data showing broad sectoral dispersion.

Fourthly, and perhaps most strikingly, the document's own logic provides unaddressed rebuttal. If manufacturing, engineering, and design sectors contribute £645 billion GVA and employ 26% of the workforce despite documented D&T provision decline, this suggests these sectors aren't dependent on school-level D&T as implied. Rather than undermining the economic case, D&T decline has coincided with sectoral resilience. The document doesn't reconcile this contradiction. Acknowledging it would require either demonstrating lag effects (decline manifesting in future economic outcomes) or conceding weaker causal links than asserted.

3.6 Rhetorical Strategies

In addition to applying Toulmin's structural analysis, three rhetorical strategies merit further analysis by revealing contradictions, argumentative weaknesses and contributing further to the epistemic trap.

Firstly, the document deploys extensive crisis rhetoric such as 'almost certain oblivion,’ or 'we must act now', or 'crisis point’, each framing declining D&T provision as existential threat. This ‘pathos’ driven urgency compresses complex policy trade-offs into moral emergency, discouraging scrutiny of costs and competing priorities. The effect positions opposition or even critical questioning as tantamount to accepting national decline. However, this urgency is rhetorically constructed rather than analytically justified. GCSE entry decline is treated as equivalent to national economic risk without intermediate analysis demonstrating connections. From argumentative standpoints, urgency substitutes for evidence and causality. Emotional framing demands immediate action but doesn't provide the evidence base for determining appropriate action or whether alternative responses might prove more effective. Moreover, crisis

framing reinforces the instrumental justification, that D&T matters because its loss would be catastrophic, not because it possesses intrinsic educational value to children, but rather the economic worth.

Secondly, the document employs 'equity framing' alongside economic arguments, contrasting D&T provision in private versus state schools and introducing rights-based, social justice appeals. This 'pathos' appeal is emotionally compelling: if advantaged 'private' education students receive D&T which is claimed to be 'thriving', this ultimately frames 'state' school students at a deficit and constitutes educational inequity. However, equity framing sits uneasily with economic argument. Rights-based claims and economic productivity claims require different evidence forms and operate according to different policy logics. The document oscillates between these without acknowledging tension. If D&T is economically essential, the equity argument becomes less convincing, economic necessity would justify universal provision regardless of equity concerns. Consequently, the economic case appears instrumental (D&T matters only for what it produces), whilst equity case appears opportunistic (invoked when economic arguments prove insufficient).

Thirdly, the document quotes three prominent 'designers', using their credibility to bolster D&T's legitimacy through 'ethos' amplification. The subject 'borrows' prestige from external authorities. However, this creates a closed rhetoric where insiders validate each other's assumptions without engaging counterarguments or alternative perspectives. No countervailing views from economists questioning causal links between school subjects and national productivity, curriculum theorists critiquing instrumentalism, or labour market analysts addressing skills shortages through structural rather than educational lenses appear. Dialectical absence produces arguments appearing robust to sympathetic audiences but fragile under critical examination. More fundamentally, this reliance on borrowed authority rather than disciplinary knowledge further entrenches epistemic ambivalence. The subject cannot defend itself on its own terms and must continually seek external validation based on unsubstantiated economic cases.

4 DISCUSSION

Whilst the pragmatism of the 'D&T Association's 'Vision' for the future of the subject in English Schools' might be understood, analysis of the 'economic case reveals a fundamental paradox in Design and Technology's positioning during a critical moment for its future. In seeking curricular survival through economic justification, the subject has become caught in an epistemic trap by expediently foregrounding an unsustainable economic case that ultimately undermines the epistemic basis of the subject. This economic framing therefore constitutes an epistemic betrayal threatening the very foundations upon which robust, enduring justification might be built.

By grounding D&T's legitimacy primarily in economic utility and external validation, advocates systematically marginalising the subject's intrinsic disciplinary knowledge, distinctive pedagogical approaches, and educational value. The limited argument positions D&T as instrumentally valuable, justified predominantly by economic value, rather than intrinsically

valuing the knowledge and practice domain in its own right. This represents epistemic infidelity which might be considered understandable in the desperate endeavour to save the subject from 'almost certain oblivion', yet paradoxically this may inadvertently accelerate demise by undermining epistemological foundations that could provide more stable, durable, and educationally defensible justification.

Analysis demonstrates systematic weaknesses across all six Toulmin elements. Claims are overstated and unqualified, presented with rhetorical certainty that evidence cannot support. Data aggregation implies causal necessity without demonstrating actual causal links between school-level D&T and economic outcomes. Warrants connecting education to economic prosperity are implied through association rather than explicitly defended through evidence. Backing relies on borrowed authority from industry voices and alignment assumptions rather than robust educational research, longitudinal evidence, or disciplinary scholarship. Qualifiers acknowledging limitations, conditionality, and contextual dependencies are conspicuously absent, leaving arguments vulnerable to economic condition shifts. Rebuttals exposing internal contradictions and alternative explanations remain unaddressed, creating closed rhetorical systems appearing persuasive only to the already convinced.

As Ball's (2012) analysis of neoliberal policy discourse suggests, in pursuing the economic case the subject becomes governable through external metrics, perpetually vulnerable to industrial priority shifts, automation trajectories, and political economic fashions. Fricker's (2007) framework on epistemic injustice further reveals how D&T's own voice, its testimony about distinctive knowledge practices, pedagogical contributions, and educational meaning, become systematically discounted and marginalised in favour of industry endorsements and tenuous macroeconomic data.

The combined effect locks D&T into epistemic precarity. A subjects justified primarily on instrumental grounds, vulnerable to displacement whenever economic conditions shift, technological priorities change, or skills demands evolve unexpectedly. Economic framing, rather than securing D&T's future, may ironically ensure continued vulnerability by making legitimacy perpetually contingent on external economic validation rather than grounded in robust disciplinary knowledge and enduring educational purpose.

This analysis suggests escaping the epistemic trap requires fundamental reorientation. D&T must reclaim its disciplinary voice and articulate value in educational rather than purely economic terms. This means foregrounding what the subject distinctively enables such as ethical engagement with material culture, critical interrogation of technological systems, creative problem-framing in ambiguous conditions, iterative design thinking, user-centred empathy, sustainability reasoning, and cultivating human judgment about how the mad world should be rather than merely how it currently is. These capabilities are profoundly educational; they develop citizens capable of shaping technological futures rather than merely serving them.

England's current curriculum and assessment review offers a rare reorientation opportunity. Rather than doubling down on economic instrumentalism, D&T advocates should articulate

visions grounded in ethical responsibility, ecological sustainability, social justice, and collective flourishing. They should position Design and/ or Technology education (2.0) as preparation not for serving existing economic arrangements but for imagining and creating alternatives. Only by escaping the epistemic trap, by reclaiming disciplinary integrity and articulating the inherent value on educational grounds, can D&T contribute meaningfully to socially just, ecologically sustainable, and democratically vibrant futures that education should serve.

5 DISCLOSURE STATEMENT

Artificial Intelligence (AI) technologies were used solely to enhance clarity and structure of the written text. All scholarly contributions, theoretical perspectives, and analyses were produced by the author.

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