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Lifting the veil on TeachersPayTeachers.com: an investigation of educational marketplace offerings and downloads

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Key words: curriculum; education publishing; instructional materials; online educational marketplace; online teacherpreneur

Abstract

TeachersPayTeachers.com (TpT) has emerged as an alternative to traditional curricular publishing houses; however, critical investigation into this for-profit platform is limited. The aggregate content offered and downloaded from the platform since 2019 was web-scraped, enabling us to construct a content model of TpT and provide descriptive results regarding the interactions between content, technology, and users/usage on TpT. We find TpT's content model implicitly redefines what constitutes an education, elevating holiday activities and classroom decor to the same level as established curriculum. In terms of content, learning standards were largely absent and user ratings were uniformly high, casting doubt upon the validity of these technological features. 87.9% of resources were under $5, however many small sales add up across users, indicating the platform extracts significant value from educators and schools. We discuss how the online educational marketplace phenomenon stands to impact the future of curriculum production and the teaching profession.

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Introduction

Online educational marketplace websites such as TeachersPayTeachers.com (TpT) have emerged as commercial platforms where educators self-publish original materials to virtual stores (Siedel and Styliamides 2018). Educators can search by keywords and then select and download lessons, activities, and supplemental resources, typically at a small cost but often for free (see Figure 1). TpT reports that nearly 70% of United States (U.S.) preschool-12th grade (P-12) teachers have downloaded one of its millions of resources. Competing platforms such as Amazon Ignite have entered the U.S. market, while TES, Twinkl, and Lehrer Marktplatz have been established in the European sphere (Siedel and Styliamides 2018).

[Insert Figure 1]

The many teachers who use educational marketplaces may think of them as neutral spaces (Benjamin 2019); however such platforms operate on the logics of neoliberalism (Apple 2013) and platform capitalism (Srnicek 2016). Developed to turn a profit, the TpT platform earns 20% from every sale, collects user data, and encourages future buying behavior. Moreover, such marketplaces promise teachers curricular flexibility and freedom, but instead can create "systems of labor arbitrage" (Means 2018, 329) that in TpT's case, may normalize teachers spending hours searching for and modifying curriculum and spending personal funds in the process. There has been limited critical investigation into online educational marketplaces (but see Pittard 2017), and such inquiry is necessary because for-profit platforms entangled in the sphere of public education stand to "increasingly intervene in and rework public education at massive scale, both within and beyond state control" (Williamson 2017, 62). Without scrutiny, educators—many of whom are enthusiastic supporters of TpT and similar platforms (Sawyer Dredger et al. 2020; Authors 2019; Torphy and Drake 2019)—risk funding and overhyping these platforms without seeing how they may exploit teachers, and impact curriculum and the teaching profession.

The purpose of this study was to lift the veil on TpT, offering a critical exploration of the totality of content offered and downloaded on TpT as of September 2019. We used web scraping to (a) describe TpT's content model (Barker 2016)—or how TpT's content has been organized and described by site developers (e.g., tags for subject area, grade level)—and (b) describe TpT's offered and downloaded content in terms of subject area, user ratings, learning standards, price, and more. We frame the content model and content offered and downloaded as an indication of the platform's *technology* design and *user* behavior (see van Dijck, 2013). Findings lend insight into the logics of the platform and how TpT is being used by teachers, enabling us to critique the online educational marketplace phenomenon in relation to the logics of platform capitalism and neoliberalism. Given the lack of scoping research into online educational marketplaces, we pursued a descriptive design, addressing questions about *what* TpT is, prior to collecting other data that might answer questions about *why* or *how.* This study therefore provides a conceptual overview of TpT that can help stakeholders better understand the educational marketplace phenomenon, contextualize future explanatory studies of educational marketplaces, and contribute to critical scholarly debates around for-profit educational platforms.

Background

This exploration is guided by van Dijck, Poell, and de Waal's (2018) framing of a *platform* as "a programmable digital architecture designed to organize interactions between users" (4). van Dijck's (2013) model of *online platforms as microsystems* explains that participatory platforms like TpT embody (a) techno-cultural structures (technology, users/usage, and content) and (b) socioeconomic structures (governance, business models, and ownership). We focus on the techno-cultural structures, considering *content* as an indication of the platform's *technology* design and of aggregate *user* activity. We therefore first describe those three components and note how existing research has spoken to these components. We then briefly address TpT's socioeconomic structures, which are also important for understanding its platform logics.

Content

van Dijck (2013) suggests that user-generated content is one of the defining features of modern social media platforms, and notes that while platform users and operators share an interest in high-quality content, "their interests also diverge" (35). TpT content--specifically, the resources being published, sold, downloaded, and reviewed, is popular with many teachers (Kaufman et al. 2018) and may in some cases be perceived as innovative, creative, and current (Authors 2019, 2020). Teacher-pleasing content is key to TpT's business model, and the platform therefore relies on users to provide feedback via a rating system and to report content that violates their policies. However, under the logic of platform capitalism, marketplaces may have little incentive to regulate content (Rodríguez et al. 2020; Authors 2020). For instance, TpT math tasks have been found to feature lower-level cognitive demands or errors (Hu et al. 2018; Sawyer et al. 2019), TpT ELA resources have been found to lack instructional guidance while failing to align to learning standards (Polikoff and Dean 2019), and TpT materials about the U.S. Civil Rights Movement have been found to present flawed historical narratives (Rodríguez et al. 2020). To date, there has been no large-scale consideration of online educational marketplace content. Such inquiry would offer insight into aggregate user behavior in a way that previous small samples in particular content areas—often without critical framing (but see Rodríguez et al. 2020)—cannot.

Another unexplored area is the ways that online educational marketplace content is "often tied up with *technology* and *user* agency" (van Dijck 2013, 35, emphasis added). Content within platforms is represented by a *content model*, a reified "concrete data structure" that dictates how users can engage with the platform's content (Barker 2016, 77). TpT's content model formalizes

certain descriptive elements of resources (e.g., subject area or grade level) in the form of particular content attributes. A content model may help users effectively engage with vast amounts of material, but such models are not neutral because their design moves platform content "from an abstract and unrestricted idea of something to a concrete representation of it, complete with the limitations and restrictions this brings along with it" (Barker 2016, 77). As a technical reification of abstract ideas, a content model lends insight into values and priorities behind a particular platform. For example, although TpT and its competitor Twinkl both include references to formal curricula and standards in their content models, TpT's model only takes into account standards prevalent in the United States, while Twinkl's is deliberately international. There is nothing preventing an educator in the French Republic from posting *content* to TpT, but the design of the *content model* suggests that TpT has not made this a priority.

Technology

van Dijck (2013) defines the technology dimension of a platform as including technical factors such as *metadata*, *protocols*, and *algorithms*. Metadata and protocols are intertwined with content in that user-generated content in TpT is not limited to just the resources that users download. Rather, resources are part of the broader content model that includes such metadata (i.e., structured information that describes and locates other information) as a title, a description, and other standardized information that help users find resources. However, it is TpT—not users—that define the fields of metadata and the values they can take. Thus, metadata are among the components of a platform governed by *protocols*, which dictate how users may operate on the platform. On TpT, metadata *protocols* include established limits on the number of tags a content creator can assign and the rating scale that users apply to rate a resource. These *protocols* can be changed at the platform owner's discretion. For example, at the time of data collection, TpT's user ratings were on a 4.0 scale, but they were subsequently changed to a 5.0 scale.

On TpT, metadata are not only governed by platform protocols but are also employed in *algorithms*—"step-by-step directive[s] for processing or automatic reasoning" (van Dijck 2013 30)—that TpT uses to direct what users see on the site. Indeed, van Dijck notes that the standardizing of content—i.e., the establishing of a content model—may be restricting for users but helpful for platforms. That is, platforms use metadata along with algorithms to manipulate buying behavior—and may profit from it in other ways in the future (Srnicek 2016). In one of the only available studies of metadata on TpT, Abramovich and Shunn (2012) found that evaluative metadata in the form of quantitative user ratings and popularity rankings played a role in users' selection of resources: resources with higher ratings and higher popularity were more downloaded. However, these metadata were poor predictors of expert-evaluated quality, raising questions about the value of TpT's content model. Other researchers have considered potential problems with other TpT technological features, such as standards tagging (Polikoff and Dean 2019) and search algorithms (Rodríguez et al. 2020); however, they have done so theoretically or at a small scope.

Users and usage

A platform's content is also shaped by users with their own agency. There seem to be a considerable number of online educational marketplace users (individuals who use the technology) (Authors 2020b; Sawyer, Dredger et al. 2020). Users may feel that TpT empowers them as authors and selectors of curriculum (Hodge, Salloum, and Benkoet 2019), thereby challenging standardization pressures that stifle their professional agency and autonomy (Apple 2013). However, educational marketplaces, like many platforms, may perpetuate inequities present within societies at large (Benjamin 2019). For example, emerging evidence suggests that

the most successful TpT sellers overwhelmingly have been White women (Authors 2019; Sawyer, Dick, and Sutherland 2020). Moreover, marketplaces may reinforce the harmful neoliberal framing of teacher-buyers and teacher-sellers as solo competitors (Connell 2013). Strapped for resources, teacher-buyers may be drawn to TpT to maximize student success on standardized outcomes, often spending personal funds and exhausting significant labor to meet these ends (Authors 2021). TpT therefore can intensify teacher work (Selwyn et al. 2017). Curriculum marketplaces might also perpetuate buyers' harmful cycles of improvement-seeking that are unattainable and rooted in individual consumption (Pittard 2017).

Still, teachers indicate that they value platforms like TpT, and that they use these platforms to search for materials intentionally and critically (Polikoff and Dean 2019), identifying content-specific resources, and then adapt them to meet their students' needs (Schroeder et al. 2019). However, this new marketplace model of curriculum may be too independent and too piecemeal—online educational marketplaces use may produce a future "where the dominant technical platforms are amongst few centralising powers uniting schools as a national school system" (Hillman, Rensfeldt, and Ivarsson 2020, 7). Given the inconsistent quality of TpT content, a future where platforms drive curriculum may be problematic. Our consideration of aggregate user behavior will provide insight into how teachers use the site and what neoliberal and platform influences are guiding that usage.

Ownership, Governance, and Business Model

Ownership, governance, and business models were not a focus of this study given the data collected; however, background on these dimensions helps in understanding the neoliberal logic and platformization of TpT. First, regarding TpT's ownership model, or how the platform's leadership evolves within the market (van Dijck 2013), at present TpT is a privately held, for-profit company run by a former Etsy COO (Fast Company Staff 2019). The company currently prioritizes "increasing the school-wide adoption of TpT and introducing new formats of content" (Sodd 2019). Another dimension is TpT's governance structure, which includes the implicit or explicit rules that manage user activity (van Dijck 2013), such as Privacy Policies (https://www.teacherspayteachers.com/Privacy-Policy). Like other platforms, TpT suffers from opaque terms of service (Authors 2019b) that many users may not even read (Obar and Oeldorf-Hirsch 2020). Unlike many platforms, TpT does not sell user data or include external advertising at this time. Additionally, many have raised concerns about poor content governance, citing plagiarism and copyright violations (Schwartz 2018) and the presence of harmful resources that are not removed when reported (Authors 2020). A final consideration is the platform's business model, or how it makes money. A key concern is that TpT frames curriculum as a good to be bought and sold by individual entrepreneurs, not provided by the state or created collectively by practitioners. While not-for-profit options have emerged (e.g., American Federation of Teachers' ShareMyLesson.com), such sites are less popular than TpT. Under for-profit models, teachers with more money have differential access to resources (Pittard 2017) and the individual approach threatens teaching's culture of sharing and collective advancement (Bennett 2019). Furthermore, while TpT markets itself as a democratizing platform for teacher content creators, we recently found that just 1% of TpT stores accounted for the vast amount of sales on the site (81%) (Authors 2020b), demonstrating a platform hierarchy that belies its egalitarian promises (see van Dijck et al. 2018).

Present Study

The present study aims to expand upon and extend previous scholarship on TpT and other educational platforms. Studies on TpT have frequently focused on targeted samples of content

(e.g., Polikoff and Dean 2019), whereas considerations of educational platforms have often holistically examined all of their respective components (e.g., van Dijck and Poell 2018; Williamson 2017). We propose an approach that combines features of both. Like previous, targeted studies, we consider actual content on TpT, adding important empirical insight to conceptual critique. However, rather than examine a sample of content to evaluate it, we treat the content as "digital traces" (Welser et al. 2008) of users' activity, as shaped by the technical design of TpT. That is, we consider both how TpT models user-generated content (an indication of what is valued by the TpT platform itself) and how 1.5 billion downloads of TpT content reflect aggregate user behavior (an indication of possible neoliberal influences on teachers).

Method

Research questions

We assessed TpT content to critically explore the techno-cultural dimensions (technology, users/usage, and content) of this platform (van Dijck 2013), asking:

1) How does the technological design of TpT *model* content?
2) What content are users *offering* and *downloading* on TpT?

Data collection procedure

We collected data through *web scraping*—automatically gathering information embedded in web pages (Munzert, Rubba, Meißner, and Nyhuis 2015). Two authors collaborated on the code over several iterations to ensure its integrity (see Authors 2021b).

This was not considered "human subjects research" by our institutions, though we remained attentive to ethical responsibilities (see Authors 2021c; Henderson et al. 2013). In particular, we determined the research value of these data merited web scraping so long as we did not identify associated individuals (see SIGCHI Ethics Committee, 2017).

Data sources

Through web scraping, we determined the number of TpT resources offered and their associated downloads. Data included all resource pages on TpT that were created (and not subsequently removed) between the site's creation in 2006 and our data collection in September 2019. Through a process of data cleaning, we removed some resources and modified others. For example, we removed resources with creation dates outside of the window of TpT's existence because it was not possible to tell what the correct creation date might be. Additionally, if a resource had no value listed for the number of downloads, we set this number to zero.

Results

Given the descriptive methods of this study, we present raw results followed by critical interpretation in the discussion.

How does the technological design of TpT model content?

TpT's content model is focused on the following key attributes: the indicated subject area(s), grade level(s), resource type(s), learning standard(s), overall user rating, and price. Figures 2 and 3 display an example TpT resource page for reference.

[Insert Figures 2 and 3]

We observed that creators can label resources with multiple tags depending on the category (which lead to some totals in the next section summing to greater than 100%) (Table 1). As of September 2019, TpT limited the number of tags a seller could assign for subject area (three tags), grade level (four tags), and resource type (three tags). Because these limits have not always been in place, some resources in our data did have more tags.

[Insert Table 1]

TpT content creators are able to tag Common Core State Standards (CCSS), Next Generation Science Standards, and Virginia and Texas State Standards, but CCSS appear to be the standards TpT has featured on resource pages. We therefore only captured CCSS, which are the most widely used learning standards in the U.S. and also the standards by which TpT enables users to organize searches. TpT reported an overall user rating value at the top of each resource's page, which was on a 4.0 scale (ratings moved to a 5.0 scale after data collection). While the means TpT used to calculate this metric was unknown, we deduced from our data that this was a summary score of all the individual user ratings made for a given resource. This was likely an average score of all user ratings rounded to the nearest 0.10 increment. For example, a resource with several thousand ratings might have had a reported 4.0 overall user rating, even if some users had actually rated it below a 4.

We observed the full listed price (in dollars) posted on each resources' page—in other words, we did not collect data related to specific purchases. Thus, we were unable to account for any promotions, sales, or special offers in place at the time of a particular transaction. Therefore, our numbers overestimate to some extent the total value of sales. However, we did use the listed *sale price* for bundles—which TpT's website defined as collections of two or more resources packaged together—rather than the sum of the *full listed prices* of the individual items in the bundle since a bundled sale price was derived from bulk purchasing rather than sales or special offers.

What content are users offering and downloading on TpT?

As of September 2019, 4,018,173 resources had been added to TpT; Figure 4 shows that the rate at which content is added to the site has grown dramatically.

[Insert Figure 4]

85.7% of the over 4 million TpT resources had been downloaded at least once. As shared in Authors et al. (2020b), at the time of data collection, there had been 1,530,382,712 downloads from the TpT site, indicating that this content is in high demand.

We retrieved the metadata for each resource. In short, we developed descriptive statistics for TpT content organized by tag (subject area, grade level, resource type, learning standards) as well as overall user rating and price.

Content and subject area

We observed offerings and downloads across the 246 possible subject area tags. Much—but not all—content was limited to three subject areas. Figure 5 presents the percentage of the resources offered and the resources downloaded across subject areas, limited to subject areas tagged in at least 1.5% of offered or downloaded resources. The most available and popular TpT resources addressed core content in *ELA*, *Math*, *Reading*, and *Writing*. Overall, offerings and downloads were relatively parallel across the top 47 subject areas. Nonetheless, an example of downloads exceeding offerings included *Holidays* (*Christmas/Hanukkah/Kwanzaa*, *Winter*, *Spring*, *Halloween*, and *Autumn*), suggesting that seasonal resources were also in particular demand. Conversely, subject areas less-emphasized by U.S. accountability regimes—such as *Social Studies*, *U.S. History*, *Art*, *Spanish*, and *EFL/ESL*—were more readily available than they were downloaded.

[Insert Figure 5]

Content and grade level

Figure 6 shows that TpT resources for elementary grades (particularly kindergarten to third grade) were the most offered and downloaded, followed by homeschool, and then secondary

grades. Resources that addressed preschool to fifth grades and home school had higher numbers of downloads than offerings, suggesting that these grades were in particular demand.

[Insert Figure 6]

Content and resource types

Figure 7 shows the most common resource types that were tagged in at least 2% of offered resources or downloaded resources. *Activities*, followed by *Printables*, *Worksheets*, *Fun Stuff*, *Literacy Centers*, and *Math Centers* were most offered and downloaded. Within these six most popular resource types, there were relatively more downloads than offerings, suggesting that ready-to-go, fun materials focused on core areas were in demand. This same pattern of higher downloads relative to offerings was true for items that were decorative in nature (*Posters*, *Bulletin board ideas*, and *Clipart*). Finally, the reverse pattern was evident for *Assessments*, *Homework*, and *PowerPoints*, where downloads were lower relative to offerings.

[Insert Figure 7]

Content and CCSS standards

Only 11.6% of offered resources had at least one CCSS tagged. Similarly, only 11.8% of downloaded resources were tagged with a standard. The ability to tag learning standards was made available in recent years, but users could retroactively add standards to previously created resources, and the vast majority of resources had been added since standards tagging was available. Figure 8 shows that beginning in 2013, the proportion of TpT resources with learning standards tagged showed small but consistent growth, as did the proportion of resources with learning standards that were downloaded.

[Insert Figure 8]

Overall user rating

Most resources were either reported as having an overall four-star rating (49.8%) or not rated at all (41.8%). Users did not often download unrated resources: 90.1% of resources downloaded were rated at four stars, 6.98% of downloaded resources were rated at 3.6-3.9 stars, 0.3% of downloaded resources were rated at 0.1 - 3.5 stars, and 2.6% of downloaded resources were not rated.

Price

Figure 9 shows that 87.9% of the 4,018,173 offered resources on the site were priced $USD 5 or under, including 15.0% (of the total) that were offered for free. The average TpT resource cost for non-free items was $USD 4.38 and the average transaction for non-free items was $USD 8.28. This indicated that free and low-cost resources were more often downloaded. Indeed, across TpT's 1,530,382,712 downloads, 69.1% were of free resources (Authors 2020b).

[Insert Figure 9]

Discussion

Our findings describe TpT's content model and the content offered and downloaded on this platform, which lend insight into TpT's technical design and use—and into the platform and neoliberal values that shape each. van Dijck and colleagues (2018) raise concerns about how platforms challenge the ideal of education as a public good that prepares "not just skilled workers but knowledgeable citizens" (117). Below, we discuss what our results mean for how platform technology and use (as perceived through TpT content) may challenge the ideals of education as a public good.

TpT and educators' curricular priorities

Examining the availability and popularity of TpT content in aggregate provides one means of measuring users' educational priorities, which are presumably driven by professional, cultural,

and political pressures. For example, it is unsurprising that the most offered and downloaded TpT content were tagged for ELA and math when one considers that U.S. accountability regimes and the widely-adopted CCSS focus on these two content areas. Thus, the prevalence of TpT Math and ELA content may reflect both teachers' focus on the core content areas prioritized by accountability systems and the neoliberal pressure on teachers to shift to the new standards independently, on short notice, and with little or no curricular support. Online marketplaces may have responded to and met teachers' perceived needs in this era of standardization (Hodge et al. 2019).

However, patterns in TpT content data also offer the opportunity to ask deeper questions about the role of the CCSS in American education. It is understandable that an educational platform would choose to adopt rather than challenge the predominant standards, but integrating those standards into the TpT content model and search interface reinforces and reifies the predominance of certain content areas over others. The CCSS arguably focus more on students' contribution to "economic vitality of the community and the nation" than their "autonomous participation in a democratic society" (Authors 2017, 115), and this platform's choice to reify the CCSS within their technological design risks furthering this emphasis.

TpT's content model and users' behavior send other messages about public education independent of the CCSS. Although teachers may want to seek classroom decorations and fun activities on TpT (Pittard 2017; Schroeder et al. 2019), it is noteworthy that the TpT content model uses a single attribute (i.e., "subject area") to encompass holiday activities and academic content areas, such that decor is treated by the platform as an equivalent to pedagogical activities. A common critique of TpT is that trite materials proliferate (Gallagher et al. 2019); our results suggest that such content appears to be disproportionately popular and that TpT's platform logics promote them in the same way as more academic content and pedagogies. Of course, the platform profits either way.

Findings also indicate that relatively fewer *Assessments*, *Homework*, and *PowerPoints* were downloaded. Teachers may have such materials "covered" within standard curriculum or may prefer to create them themselves. Alternatively, users' downloads may suggest that teachers do not value standardized assessments, homework, and teacher-centered approaches. Teachers report using TpT to engage students with particular concepts (Schroeder et al. 2019), so when teachers spend their own money and use their own time to find curriculum, many of them do not appear to be as interested in materials that center evaluation and standardization. Ultimately, we wonder to what extent TpT reflects and responds to the education values and priorities that exist and/or to what extent it shapes those values and priorities.

TpT and the resourcing and funding of education

Next, the robust use of TpT that we observed may underscore the chronic under-resourcing of public education in the U.S. that has resulted from neoliberal practices (Apple 2013). Smaller scale studies have found that teachers say they need TpT to find engaging, student-centered activities, and to differentiate teaching (e.g., Authors 2021; Schroeder et al. 2019)—areas that this study reinforces may be lacking in some teachers' standardized curriculum. Elementary teachers may need particular support given the vast repertoire of content they teach[1]—hence the heightened TpT activity surrounding elementary grades that we observed.

Second, these findings, taken together with our previous work (Authors 2020b), shed new light on how money is and is not exchanged on TpT. Most TpT users spend just a few dollars for

[1] However, it may also be the case that a small portion of elementary teachers simply download large quantities of TpT material.

a resource and many download free items; however, many small sales "add up" across users. On one hand, this finding could counterbalance concerns that online educational marketplaces threaten teachers' culture of sharing (Bennett 2019), as it seems that free sharing is more commonplace on TpT than previous researchers understood (e.g., Pittard 2017). When teachers *do* spend money on TpT, they may believe it is worth their $USD 8 (on average) to acquire something that spices up their class, covers them with a teacher-tested substitute activity, or yes, makes their classroom more attractive (Authors 2021). Also, some TpT content creators reap significant profits (Authors 2020b), which may be a meaningful source of income for U.S. teachers who have suffered declining salaries under neoliberal policies (Allegreto and Mishel 2019).

But on the other hand, teachers' robust TpT use may illustrate how the platform extracts significant value from educational systems and individual teachers (Means 2018). With $USD 3.9 billion in sales (Authors 2020b) and sales growing each year, TpT appear to be generating notable profits. These profits are extracted from individual teachers who pay out of pocket and school districts who have purchased TpT subscriptions—fees that can be understood as "capitalist rent," necessitating an "endless cycle of billing" (Means 2018, 335). Moreover, online educational marketplaces may present yet another way for *schools* to extract value from teachers, through their labor to search for curriculum and their uncompensated purchasing. TpT's model may legitimize the notion that teachers can and should purchase their way to professional worthiness (Pittard 2017). As such, rather than simply offering an alternative to the products traditionally offered by curriculum publishers, TpT may be creating a new market by manufacturing demand where it had not previously existed (Williamson 2021).

TpT and matters of quality

Finally, users may assume that a platform's search and filtering dimensions (such as the ability to search by standards and highest user ratings) are unbiased, helpful site features (Benjamin 2019; van Dijck 2013). However, a platform's technology is designed to increase profits and site traffic (Srnicek 2016). Our results suggest that two TpT platform protocols, learning standards and user ratings, may be deceptive to users and are inaccurately shaping perceptions of what quality educational materials are.

We have previously considered TpT's reification of the CCSS, but it is perhaps more worrying that the platform's representation of these standards may not be reliable. Polikoff and Dean (2019) found that TpT "materials are weakly to moderately aligned with the standards to which they claim alignment" (12). Integrating a series of CCSS-flavored checkboxes into the TpT content model creates the possibility of a form of *moderation theater,* presenting the illusion that resources are vetted and of high quality, even if this confidence is unfounded. By including the CCSS in its content model, TpT can claim that it allows teachers to search for materials particularly well-suited for public education; likewise, individual sellers can perpetuate the theatrics by checking a box rather than offering a detailed assessment of a resource's alignment with standards. The fact that TpT users largely ignore the CCSS-tagging (whether when selling or downloading) raises further possibilities along these lines. On one hand, this could signal teachers' rejection of platform theatrics in favor of individual, holistic assessment of resources. On the other, it may raise questions about the extent to which the CCSS project in its entirety is theatrical—there are evidently compelling reasons for teachers to offer and download ELA and mathematics-focused materials, but do their professional settings continue to put emphasis on the CCSS in the years following their adoption?

Furthering concerns about *moderation theater*, TpT's user rating feature was found to be effectively useless: resources were either not rated or rated highly.[2] Across TpT resources that *were* rated, the present study concurs with Abramovich and Schunn's (2012) small-scale analysis that TpT resource ratings were almost universally high, raising questions about how helpful ratings are. However, buyers seem to rely on ratings since 90.1% of all TpT downloads were of 4-star items. In short, TpT users seem to trust the ratings feature, despite these ratings' apparent lack of validity. van Dijck (2013) critiques Facebook's "like" button, arguing that it not only redefines what it means to "like" something (in a simplistic way) but also drives behavior through that new definition. In this case, TpT reduces educational quality to a star system and thereby influences how teachers evaluate classroom material. While giving teachers the ability to collectively evaluate educational resources arguably recognizes their professional qualifications and empowers them, this study raises flags regarding the TpT-dictated terms by which those evaluations happen.

A final, and more pressing issue relating to TpT's seemingly limited incentive to regulate content is the proliferation of racist and harmful content on TpT (Rodríguez et al. 2020). The educational marketplace model relies on user vetting to flag offending content, but we have previously observed that enforcement is inconsistent (Authors 2020). This has resulted in harmful practices including a reliance on free labor (Selywn et al. 2017) from users who are willing and able to report harmful content, and a failure to remove "bad" resources. When TpT has on occasion attempted to regulate content, they have reportedly removed large quantities of resources that address sensitive topics without regard for the actual quality of the content or making efforts to support content creators in revising said content. In sum, the capitalist logic of online educational marketplace platforms appears to hinder such platforms' ability to maintain quality curriculum, particularly curriculum addressing controversial topics.

Limitations

We acknowledge limitations to this research. Web scraping allowed for the collection of tremendous amounts of data but was limited by the availability and structure of the web resources in question. For example, we could not determine the actual price paid for any item at the time of downloading and therefore took the conservative route of assuming that all unbundled transactions happened at items' full prices. Similarly, we had no way of accounting for resources that had been deleted over time, changes to resource tagging over time, or new resources added since data collection. Results were limited by the data we could collect, and our analysis was exclusively descriptive and observational. The data could not explicitly address the ownership status, governance, and business models dimensions of van Dijck's framework (2013). Additionally, this study's findings were not predictive in nature and were limited to a single platform. Future research should examine other educational marketplace platforms, open educational resource repositories, and traditional curriculum publishing houses. Study of how teachers navigate a marketplace and the surrounding social media ecosystem, how they judge quality, and ultimately how they integrate marketplace resources is needed (Clements and Pawlowski 2012; Fyfield et al. 2020).

Conclusion

Ten years ago, TpT was a largely unknown website that hosted fewer than 30,000 resources. Competitors Amazon Ignite, Houghton Mifflin Harcourt Marketplace, TES, and Twinkle did not

[2] Although, the preponderance of high ratings versus no ratings may be an artifact of sellers removing low rated resources, which may be a helpful practice if we assume low rated resources are indeed of low quality.

exist or had even less visibility. Today, TpT and the online educational marketplace model have assumed an established place in education in the U.S. and other countries, as many teachers appear to make use of at least some of these platforms' massive and steadily growing stocks of resources. As marketplace models of curriculum rapidly expand, there is much at stake.

First, ownership of curriculum is at stake. On one hand, educational marketplaces offer teachers novel opportunities as curriculum writers (Hodge et al. 2019); however much of TpT's most downloaded content is contributed by a small group of *super users* (many of whom are White women) suggesting that the platform is not as much of a democratizing force in curriculum as might be hoped (Authors 2020b; Sawyer Dick et al. 2020). Worse, marketplace content is controlled by the platforms, which bring commercial interests and opaque business models. Platform algorithms, content models, metadata, and protocols regulate how teachers are able to engage with a marketplace, meaning the platform controls what curricular materials are made visible to teachers and therefore what makes it into classrooms (Fyfield et al. 2020). Ceding this control to the platforms could be problematic given racist algorithms, for-profit motives, and poor decision making that has enabled the spread of inaccurate, untrustworthy, and low quality information (Benjamin 2019; Vaidhyanathan 2018). If online educational marketplaces continue to proliferate, such platforms along with other digital classroom technologies may be among the few centralizing powers governing what children learn (Hillman et al. 2020).

The quality of curriculum is at stake. For all their control of user behavior, ironically online educational marketplaces do little to control their content (Authors 2020). We find that learning standards and user ratings may be deceptive aspects of TpT's technology that instill a false sense of confidence in buyers that they are downloading high-quality curriculum. Given the evidence of low quality and harmful TpT content and a lack of market-driven incentive to remove or reform such content, low quality classroom material may only proliferate. Still, teachers' enthusiasm for online educational marketplaces suggests that they value the content within. TpT has arguably been an asset for some under-resourced teachers in need of curriculum and/or support (Schroeder et al. 2019). Indeed, given recent attacks on curriculum by U.S. state governments (Gabriel and Goldstein 2021), online educational marketplaces may offer sites of resistance where teachers can share culturally relevant and sustaining curriculum beyond school walls. Overall, online marketplaces meet teachers' needs and wants in ways that current systems of curriculum do not, however quality control is a serious concern.

Finally, teacher professionalism is at stake. While online educational marketplaces have advanced some opportunities for teacher leadership and collaboration along with offering new ways for teachers to profit from their professional expertise (Torphy and Drake 2019; Authors 2019, 2020), the neoliberal logic of these marketplaces also simultaneously threatens teacher professionalism. Platforms like TpT extract value from teachers (Means 2018) when they pay out of pocket for curriculum and labor to find classroom resources. Like other platforms operating in education, TpT claims to offer flexibility and choice but simultaneously exploits teachers' labor (Houlden and Veletsianos 2020) therefore intensifying teachers' work (Selwyn et al. 2017). Additionally, online educational marketplace's *find it yourself* approach to curriculum emphasizes teacher individualism and private advantage over professional collaboration (Connell 2013). Still, many teachers want to use TpT and find it empowering to create and select their own curriculum. Nonetheless, such marketplaces perpetuate the expectation that individual teachers must buy more to be worthy practitioners, a practice that is inequitable and counterintuitive to education as a public good (Pittard 2017).

Given what is at stake, this study has implications for educators, educational marketplace platforms, and researchers. Teachers must understand the ethical and financial implications of such platforms. van Dijck's (2013) *platforms as microsystems* framework may facilitate exploration of how for-profit imperatives drive platforms' content models, user experience, what is done with user data, etc. to "make calculated decisions whether to utilize [them] based on how much they will benefit" (van Dijck 2013, 41). Content creators must accept their role, revising based on buyer feedback and creating materials that are pedagogically sound and not just likely to sell. Checklists that guide critical curricula evaluation (e.g., Gallagher et al. 2019), although inherently limited (Rodríguez et al. 2020), may structure such work. Additionally, more critical and action-oriented research into online educational marketplaces is needed, along with public reporting focused on compelling platforms to change (such as Authors 2020), and work with policy makers and local decision makers to encourage critique before schools adopt such platforms (Hillman et al. 2020).

To conclude, we emphasize that this critical research of online educational marketplaces is not, as a rule, opposed to such models of curriculum sharing altogether. Rather, we advocate for scrutiny of TpT's sociotechnical and socioeconomic structures (van Dijck 2013) which accounts for the logics of neoliberalism and platform capitalism. Critical approaches may help educational stakeholders better understand online educational marketplaces, including the less-visible ways that platforms like TpT may deceive users, exploit teachers, and control curriculum.

Declaration of interest statement: The first author brought to this study first-hand experience with the TpT platform as a seller on the site and the second author offers one free resource on the site. The other authors have never been sellers on the site.

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Figure captions

Figure 1. Screenshot of the TeachersPayTeachers.com homepage
Figure 2. Screenshot of TpT resource webpage, shared with seller's permission
Figure 3. Screenshot of ratings section of TpT resource webpage, shared with seller's permission

Figure 4. Number of new resources added to TpT from 2006 - 2019
Figure 5. Percentage of offered resources and downloaded resources across subject areas
Figure 6. Percentage of offered resources and downloaded resources across grade levels
Figure 7. Percentage of offered resources and downloaded resources across resource types
Figure 8. Percentage of offered resources and downloaded resources across CCSS standards
Figure 9. Percentage of offered resources and downloaded resources across prices